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**OPERABLE UNIT 4  
SITE 4 – BTEX PLUME**

**NAVAL WEAPONS INDUSTRIAL RESERVE PLANT  
BEDFORD, MASSACHUSETTS**



**Naval Facilities Engineering Command, Mid-Atlantic  
U.S. Navy**

**September 2009**

**Record of Decision  
Naval Weapons Industrial Reserve Plant Bedford  
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Part 1: The Declaration**

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**PART 1: DECLARATION**

**I. SITE NAME AND LOCATION**

Naval Weapons Industrial Reserve Plant (NWIRP)  
Hartwell Road  
Bedford, Massachusetts 01730  
EPA ID# MA6170023570  
Operable Unit 4 – BTEX Plume

**II. STATEMENT OF BASIS AND PURPOSE**

This Record of Decision (ROD) presents the selected remedy for Operable Unit (OU) 4, Site 4, the Benzene, Toluene, Ethylbenzene, and Xylenes (BTEX) Plume, at the NWIRP Bedford, Massachusetts. NWIRP Bedford was placed on the National Priorities List (NPL) in May 1994. The remedy was selected in accordance with the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA), as amended by the Superfund Amendments and Reauthorization Act of 1986 (SARA), and, to the extent practicable, the National Oil and Hazardous Substances Pollution Contingency Plan (NCP). The regulatory program performed under the context of these combined laws and regulations is commonly referred to as "Superfund." The U.S. Department of the Navy is the lead agency for this action. This decision has been selected by the U.S. Navy and the U.S. Environmental Protection Agency (EPA). The Massachusetts Department of Environmental Protection (MassDEP) statement on the selected remedy is presented in Appendix A. The funding source for the Site 4 cleanup is the Environmental Restoration, Navy (ER,N) program.

This decision is based on information contained in the Administrative Record (Appendix D), which has been developed in accordance with Section 113 (k) of CERCLA and which identifies each of the documents upon which the Site 4 remedy decision is based. The Administrative Record is maintained at the Naval Facilities Engineering Command (NAVFAC) office in Norfolk, Virginia. A public information repository is also kept at the Bedford Public Library in Bedford, Massachusetts.

Site 4 is one of several OUs at NWIRP Bedford. Site 4 has been addressed independently from the rest of NWIRP Bedford so that the Navy can proceed with closure of this site as soon as it has met the requirements of the CERCLA process. The remedy selection decision for Site 4 is not expected to have an impact on the strategy or progress for the rest of the sites at NWIRP Bedford.

**III. ASSESSMENT OF THE SITE**

The selected remedial action is necessary to protect the public health or welfare or the environment from actual or threatened releases of hazardous substances into the environment.

**IV. THE SELECTED REMEDY**

The selected remedy is a comprehensive approach for this OU that addresses potential human health risks associated with groundwater contamination at Site 4. The selected remedy will reduce contaminant concentrations in source area soil and the associated groundwater plume, and environmentally restore the property. The major components of this remedy include:

- Selective excavation of the source area, based on the results of pre-design investigation sampling
- On-site treatment of the excavated soil using bioremediation (biopiles), or off-site disposal

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- On-site treatment and discharge of water from the excavation (if soil dewatering is required) via the existing groundwater treatment system at NWIRP Bedford
- Potential application of enhanced bioremediation in the excavated source area
- Monitored natural attenuation (MNA) of the residual BTEX concentrations in groundwater (includes long-term groundwater monitoring)
- Institutional controls prohibiting the use of site groundwater, prohibiting residential redevelopment of the site, and restricting site building occupancy (includes annual compliance inspections and reporting).
- Five-year reviews by the Navy, in conjunction with EPA and MassDEP, until site conditions are suitable for unlimited use and unrestricted exposure.

**V. STATUTORY DETERMINATIONS**

The selected remedy is protective of human health and the environment, complies with federal and state requirements that are applicable or relevant and appropriate to the remedial action, satisfies the statutory requirements of CERCLA §121 and the regulatory requirements of the NCP, is cost-effective, and utilizes permanent solutions to the maximum extent practicable. The selected remedy satisfies the statutory preference for "treatment" as a principal element of the remedy through ex-situ bioremediation (biopile) of source area soil, if used. Because this remedy may result in hazardous substances remaining on-site above levels that allow for unlimited use and unrestricted exposure (depending on the time for MNA to achieve cleanup goals), a statutory review will be conducted within five-years after initiation of the remedial action to ensure that the remedy is, or will be, protective of human health and the environment. Five-year reviews will be continued until site conditions are suitable for unlimited exposure and unrestricted use.

**VI. ROD DATA CERTIFICATION CHECKLIST**

The following information is included in the Decision Summary section of the ROD:

- Chemicals of Concern (COCs) and their respective concentrations (Part 2, Section V)
- Baseline risk represented by the COCs (Part 2, Section VII)
- Cleanup levels established for COCs and the basis for the levels (Part 2, Section VIII)
- Current and future land and groundwater use assumptions used in the baseline risk assessment and ROD (Part 2, Section VI)
- Land and groundwater use that will be available at the site as a result of the selected remedy (Part 2, Section XI.D)
- Estimated capital, annual operation and maintenance (O&M), and total present worth costs; discount rate; and the number of years over which the remedy cost estimates are projected (Part 2, Section XI.C); and
- Decisive factors that led to selecting the remedy (Part 2, Section XI.A and Section XII).

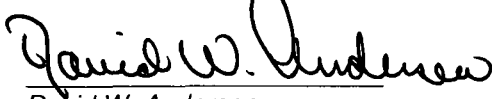
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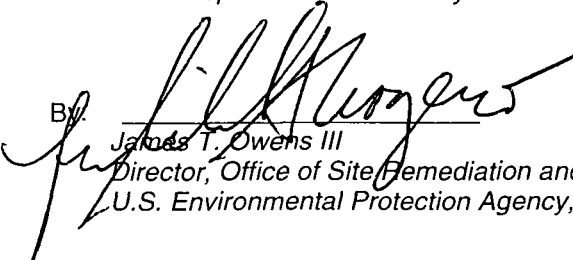
**VII. AUTHORIZING SIGNATURES**

This ROD documents the selected remedy of source area excavation and monitored natural attenuation for OU 4 (Site 4) at NWIRP Bedford. This remedy was selected by the Navy and EPA. MassDEP's statement on the selected remedy is presented in Appendix A.

Concur and recommended for immediate implementation:

By:   
David W. Anderson  
Director, Installations and Equipment Office  
Naval Sea Systems Command  
U.S. Department of the Navy

Date: 10 SEP 2009

By:   
James T. Owens III  
Director, Office of Site Remediation and Restoration  
U.S. Environmental Protection Agency, Region I

Date: 9-28-09



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**PART 2: DECISION SUMMARY**

**I. SITE NAME, LOCATION, AND DESCRIPTION**

NWIRP Bedford is a 46-acre facility located in the Town of Bedford, Middlesex County, Massachusetts (Figure 1). NWIRP Bedford is owned by the U.S. Government (i.e., the Navy), and was historically operated by Raytheon Company of Waltham, Massachusetts. The mission of NWIRP Bedford was to design, fabricate, and test prototype weapons equipment, such as missile guidance and control systems. Activities at NWIRP Bedford were historically conducted in two main structures: the Components Laboratory to the north of Hartwell Road, and the Flight Test Facility to the south. Raytheon conducted its operations at NWIRP from its inception in the mid-1950s through December 2000. The facility has remained vacant since that time.

Site 4, the BTEX Plume, is associated with a former Transportation Building (vehicle maintenance) and its former underground storage tank (UST). The Site 4 source area is located in the northern portion of NWIRP and the associated dissolved-phase BTEX plume in groundwater extends to an off-property wetland area by Elm Brook (Figure 2). The fringe of the Site 3 plume (chlorinated solvents) overlaps with Site 4 and the respective COCs are co-mingled. Because both sets of contaminants are volatile organic compounds (VOCs), the remedial activities at Site 4 also reduce contaminant concentrations within that portion of the Site 3 plume. The Navy will prepare a separate Proposed Plan and ROD for Site 3.

**II. SITE HISTORY AND ENFORCEMENT ACTIVITIES**

**A. Site History**

The contamination at Site 4 is due to a combination of the former Transportation Building operations and a leaking UST. The Transportation Building was constructed in 1961 and was demolished in November 2001. The building was used for equipment storage and vehicle maintenance. Based on the observation of oil staining, it is possible that some waste petroleum may have been released to the ground from garage operations. The Site 4 plume also is due to a leaking pump from a 7,600-gallon UST located adjacent to the former Transportation Building. The timing of the release is unknown, but was discovered when the UST was removed during December 1988 to January 1989. During the tank removal, soil in the vicinity of the UST also was removed, vertically down to the water table (located approximately 18.5 feet below ground surface [bgs]), and over an area extending to the edge of the Transportation Building. The excavation did not extend beneath the building and it is likely that contaminated soil remained below the foundation. From 2000 to 2003, the Navy completed two CERCLA removal actions intended to reduce source area COC concentrations (see Section II.C). Since that time, the Navy has been performing semi-annual groundwater monitoring and evaluating the effectiveness of natural attenuation for reducing COC concentrations at Site 4.

**B. History of Investigations**

BTEX compounds were the primary groundwater contaminants detected in the source area. Previous investigations at Site 4 have identified a dissolved-phase BTEX plume in groundwater extending from the source area to the north to an off-property wetland area. The BTEX plume was identified as being approximately 50 feet in width and 700 feet in length (Figure 2). Previous studies and enforcement activities at Site 4 are summarized below:

Previous Study / Investigation*	Date	Previous Investigation Activities
Installation Restoration (IR) Program	1986	The Navy began evaluating sites at NWIRP Bedford under the IR Program for investigating and cleaning up contaminated sites.
Phase I Remedial Investigation (RI)	1989	The Navy performed the first phase of the RI and a supplemental investigation, to evaluate the extent of contamination at NWIRP Bedford. The Phase I RI identified Site 1, Site 2, USTs for fuel and wastes, leach

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		fields, dry wells, and waste storage areas as locations of potential contaminant sources. The supplemental investigation was a limited site investigation to identify potential contaminant source areas. It included a facility inspection, analytical results of groundwater monitoring, and a soil gas survey.
UST Removal	1989	The Navy removed the UST and some petroleum-impacted soil. See Section II.A.
Draft Phase II RI	1994	The Phase II RI addressed data gaps from the previous investigations and identified Site 4.
Draft Phase II RI	1996-1997	Additional data gaps from the Draft Phase II RI were filled to identify potential sources of contamination. Baseline human health and ecological risk assessments were performed, indicating that potential threats to human health were associated with site groundwater. No unacceptable ecological risks were identified.
Final Phase II RI	2000	Supplemental investigations of Site 3, Site 4, and the Southern Flight Test Area were performed to evaluate potential sources and the extent of contamination at these sites. A report detailing all previous RI activities was prepared and published in September.
Monitored Natural Attenuation (MNA) Assessment	2000	An assessment was conducted to determine whether the groundwater geochemistry in both the source area and groundwater plume area was favorable for natural attenuation to occur.
Feasibility Study (FS) and FS Addendum	2001	The Navy prepared an FS to identify the remedial action objectives for Site 4 and to identify and evaluate cleanup alternatives. An addendum was prepared to update a portion of the human health risk assessment.
Removal Action	2000-2002	The Navy conducted a source area removal action at Site 4 using in-situ chemical oxidation to significantly reduce contaminant concentrations in soil and groundwater. See Section II.C.
Removal Action to Continue Response Actions	2003-2004	The Navy conducted a second source area removal action at Site 4 using in-situ thermal treatment to further reduce the contaminant concentrations in the source area. See Section II.C.
Groundwater Monitoring and MNA Assessments	2004-2009	The Navy has been conducting groundwater sampling to monitor plume concentrations over time and to evaluate the effectiveness of natural processes to attenuate the residual contaminant concentrations. The latest results (TtNUS, 2008b) indicate that natural attenuation is occurring at the site to some degree, but that the site cleanup would benefit from an additional source area action.
FS Addendum No. 2	2008	The FS was modified to include excavation as an additional source area removal option.

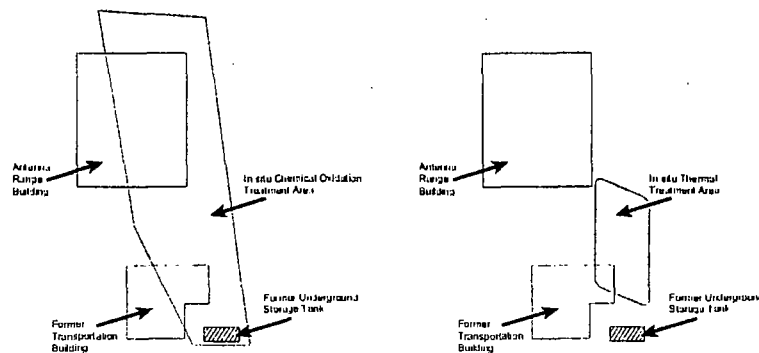
\* - The documents listed herein are available in the Administrative Record and provide detailed information used to support remedy selection at Site 4.

**C. Summary of Completed Removal Actions**

The Navy has completed two removal actions to reduce COC concentrations in the Site 4 source area: (1) in-situ chemical oxidation (ISCO); and (2) in-situ thermal treatment using electrical resistance heating (ERH). The ISCO and ERH treatment areas are shown on Figure 3.

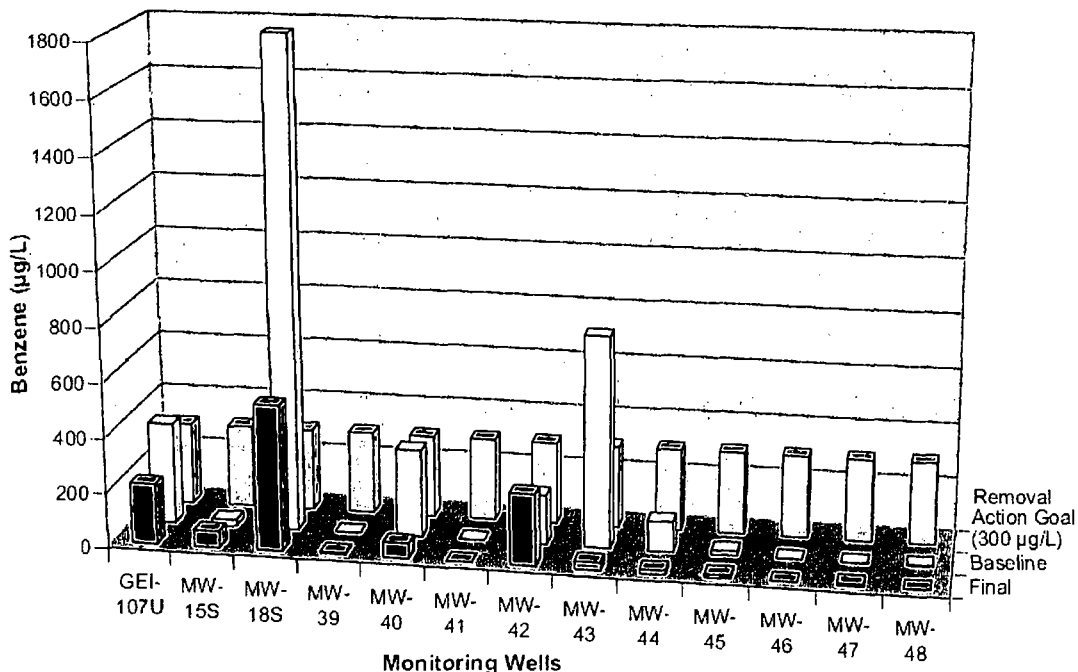
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**Figure 3 – Removal Action Areas (ISCO and ERH)**

In 2000, the Navy proactively implemented ISCO in the Site 4 source area. For this first removal action, the Navy developed a goal to reduce BTEX concentrations in the source area such that the groundwater plume would naturally attenuate over time. Since benzene has the longest cleanup time and the lowest regulatory standard (5 µg/L), the removal action goal was based on benzene. Modeling of BTEX concentrations in groundwater indicated that reducing benzene concentrations to 300 µg/L or less in the source area would achieve the cleanup goals. Three rounds of oxidant injection were conducted from 2000 to 2002 and the changes in groundwater COC concentrations were monitored. The results are summarized on Figure 4. Although the ISCO treatment reduced contaminant concentrations, the desired cleanup goal was not achieved throughout the site treatment area (TtNUS 2000a). Therefore, additional remedial measures were deemed appropriate to achieve the Site 4 removal action goal.

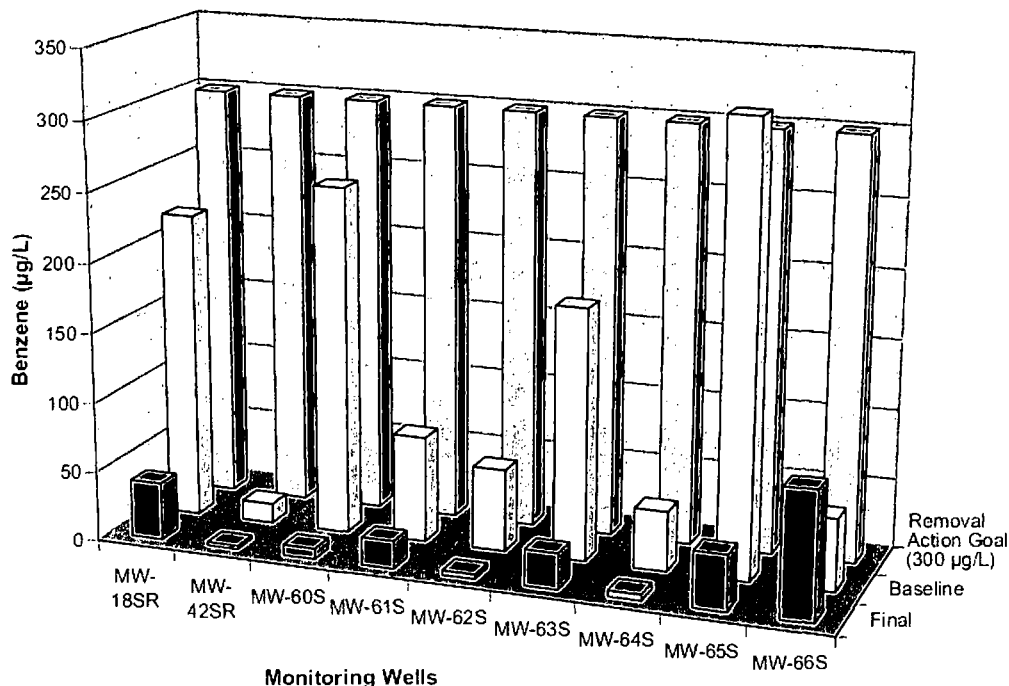


**Figure 4 – Benzene Concentrations Before and After ISCO Treatment**

Because ERH was already being used nearby at NWIRP Bedford for a separate pilot study program at the Site 3 source area (Figure 2), the Navy had the opportunity to use this treatment technology at Site 4. In 2003,

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the Navy implemented ERH in an approximate 25 by 50 foot area (target depth: 10 to 28 feet bgs) to continue the Site 4 source area response action. The objective for the Site 4 ERH treatment was to achieve a benzene concentration of 50 µg/L in groundwater. The desired temperature of approximately 100 °C was achieved and maintained for 16 days. The results are summarized on Figure 5. Within the treatment area, BTEX concentrations in groundwater were reduced by 82.2 to 99.7 percent. Monitoring results immediately following the treatment indicated that benzene concentrations were below 50 µg/L in all but one well, MW-66S, which was located outside the treatment area (TtEC, 2008).



**Figure 5 – Benzene Concentrations Before and After ERH (Thermal Treatment)**

Subsequent groundwater monitoring events through 2009 indicate that source area BTEX concentrations have increased since the thermal treatment. During the four sampling events conducted from 2005 to 2007, total BTEX concentrations in source area well MW-18SR were relatively stable at approximately 1,850 µg/L, with both benzene (up to 86.3 µg/L) and ethylbenzene (up to 806 µg/L) exceeding the remediation goals (5 µg/L and 700 µg/L, respectively). During the most recent sampling event (March 2009), the total BTEX concentration in MW-18SR was 1,284 µg/L, with only benzene (12 µg/L) exceeding its remediation goal. It is believed that some of the observed rebound in groundwater BTEX concentrations is due to the release of soil-bound BTEX which was not removed during the two source area treatments.

**D. History of CERCLA Enforcement Activities**

In May 1994, EPA listed NWIRP Bedford on the NPL, thereby indicating that the property was a federal priority for environmental investigation and cleanup. Since that time, environmental studies and activities at NWIRP Bedford have been conducted by the Navy in accordance with CERCLA and the NCP, which is consistent with the DoD's IR Program.

Based on the designation of the NWIRP Bedford property as an NPL site, a Federal Facility Agreement (FFA) was executed by the Navy and EPA. The FFA became effective in September 1999 and established the Navy as the lead agency for the investigation and specified cleanup of designated sites within the NWIRP Bedford

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property, with EPA providing oversight. MassDEP is not party to the FFA; however, in accordance with CERCLA and the NCP, MassDEP has participated in ongoing discussions and strategy sessions, as well as provided oversight and guidance through their review of the Navy's IR Program documents.

In accordance with the FFA, the Navy provides a Site Management Plan (SMP) with task schedules and deliverables, updated annually each June, and published each September. The SMP serves as a management tool for the Navy and EPA for planning, reviewing, and setting priorities for environmental investigative and remedial response activities to be conducted at NWIRP Bedford.

### **III. COMMUNITY PARTICIPATION**

Throughout the site's history, the Navy has kept the community and other interested parties apprised of Site 4 activities through informational meetings, fact sheets, press releases, public meetings, and contact with local officials, as summarized below. Also, the Navy periodically meets to discuss the status and progress of the IR Program with the Restoration Advisory Board (RAB), which includes representatives from the community. Representatives from the Navy, EPA, MassDEP, and local government have attended the public meetings and hearings.

In addition, the Navy has developed an Administrative Record which is available for public review at the Navy's NAVFAC office in Norfolk, Virginia. A local information repository has also been established at the Bedford Public Library in Bedford, Massachusetts. The Administrative Record has been made available on CDs since December 2004 (updated in 2008). An index for the Administrative Record is provided in Appendix D.

<b>Date</b>	<b>Community Participation Event</b>
November 1992	The Navy released a community relations plan that outlined a program to address community concerns and keep citizens informed about and involved in remedial activities.
September 1995 to present	The Navy initiated a series of public meetings, at which the RAB process was explained and community members were asked to join the RAB. A sufficient number of volunteers were assembled and RAB meetings began in March 1996. Since that time, RAB meetings have been held periodically to keep the RAB and local community informed of IR activities. These meetings have provided updates of IR activities throughout the process.
April to October 2000	The Navy submitted an Action Memorandum to the public that summarized its plans for a removal action at the Site 4 source area. The Action Memorandum presented two cleanup alternatives, and identified the selected action: in-situ chemical oxidation (ISCO). Comments received on this memorandum were considered, and incorporated into the final Action Memorandum, dated October 2000 (TtNUS, 2000c).
April 25, May 2, and May 9, 2002	The Navy published a notice of availability for the Site 4 Proposed Plan in the Bedford and Lexington Minuteman newspapers. The Navy also provided copies of the Proposed Plan to the community mailing list maintained for the site, and placed a copy of the Proposed Plan at the Bedford Public Library.
May 1, 2002 to May 31, 2002	The Navy offered the RI/FS reports, Proposed Plan, and Administrative Record for public comment, in accordance with the requirements of the NCP and the SMP developed for the NWIRP Bedford Superfund program. The public informational meeting and public hearing on the Proposed Plan was held on May 14. The 2002 Proposed Plan stated that the Navy proposed ISCO for soil and groundwater in the source area, followed by MNA for the remaining groundwater plume area. A transcript of the public hearing is included in Appendix E1. Written comments received during this comment period are included in Appendix E2. As noted in Section II.C, the ISCO removal action was only partially successful; therefore, the Navy conducted an additional removal action using in-situ thermal treatment in 2003.

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Date	Community Participation Event
February 2004	The Navy submitted a draft Action Memorandum to Continue Response Actions at Site 4 to the public. The Action Memorandum discussed the ongoing cleanup, and considered additional actions for Site 4. The document identified the selected option for continuing the response action at Site 4: in-situ thermal treatment. The Action Memorandum also included the information collected at Site 4 during the completion of the ISCO treatment, as appropriate (TiNUS, 2004).
December 2004	The Navy issued a public fact sheet describing a change to the previously published Proposed Plan for the Site 4. The proposed change was in the selected remedy from ISCO in the source area with MNA in the groundwater plume area to in-situ thermal treatment in the source area with MNA for the groundwater plume. The fact sheet summarized the information obtained during the removal actions that led to the change in the selected remedy.
June 2009	As noted in Section II.C, source area COC concentrations have rebounded somewhat since the 2003 thermal treatment. Therefore, the Navy presented a new Proposed Plan for public comment, in accordance with the requirements of the NCP and the SMP developed for the NWIRP Bedford Superfund program. A public informational meeting and public hearing on the Proposed Plan were held on July 14, 2009. The 2009 Proposed Plan specified additional source area excavation followed by MNA for the remaining groundwater plume area. A transcript of the public hearing is included in Appendix E3. Written comments received during this comment period are included in Appendix E4.
September 2009	The Navy provided responses to comments received on the 2009 Proposed Plan during the comment period. These are provided in the Responsiveness Summary, which is included in Part 3 of this ROD.

#### **IV. SCOPE AND ROLE OF OPERABLE UNIT OR RESPONSE ACTION**

As outlined in the FFA for NWIRP Bedford, there are four sites which have been undergoing study and cleanup (as necessary). Site 4 is one of the operable units (OU) being addressed, and is the subject of this ROD. The remaining OUs are progressing through the CERCLA cleanup process independently from Site 4, and are the subject of other RODs. RODs have been completed for OU-1 and OU-2, which require no further action. A Feasibility Study is currently being prepared for OU-3 (chlorinated solvent groundwater plume).

The selected remedy for Site 4 provides for the excavation and ex-situ treatment of additional source area soil followed by MNA of residual COCs in groundwater. The selected remedy addresses both the current and future human health risks associated with COCs in groundwater and meets all pertinent state and federal regulations. No unacceptable ecological risks were identified at Site 4.

These actions will address potential threats and present the final response actions for Site 4. The Site 4 ROD is one component of the Superfund program at NWIRP Bedford and, as such, has proceeded on an independent track to enable the Navy to expedite site closure and property transfer. The proposed remedy for Site 4 is not expected to have an adverse impact on the strategy or progress for the remaining OU (Site 3) at NWIRP Bedford. The fringe of the Site 3 plume (chlorinated solvents) overlaps with Site 4 and the respective COCs are co-mingled. Because both sets of contaminants are VOCs, the remedial activities at Site 4 also reduce contaminant concentrations within that portion of the Site 3 plume. The Navy will prepare a separate Proposed Plan and ROD for Site 3.

#### **V. SITE CHARACTERISTICS**

Site 4 lies in the northern portion of NWIRP Bedford, extending from the top of Hartwells Hill and north towards Elm Brook and its associated wetland area (Figure 2). The main structure still present in the vicinity of Site 4 is the Antenna Range Building. The Transportation Building was removed in November 2001. The northern slope of Hartwells Hill just north of the Antenna Range Building drops steeply from an elevation of

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approximately 170 feet to about 140 feet above mean sea level (msl) by the property boundary and continues to drop towards Elm Brook and its associated wetlands. These wetlands to the north represent local low topographical points, with elevations ranging from approximately 110 to 114 feet msl.

The geology of NWIRP Bedford consists of glacial deposits overlying bedrock. Hartwells Hill is a drumlin, composed of a bedrock knob, overlain by glacial sediments consisting of unstratified silty sand underlain by dense till. Subsurface materials encountered during past overburden drilling and soil excavation in the Site 4 source area consisted of silty sand and gravel fill (6 to 12 feet thick), underlain by sandy till (8 to 12 feet thick), and silty-clay till (70 to 80 feet thick) (Figure 6). In the low-lying area north of the Antenna Range Building, glacio-lacustrine sands, peat, and glacial sandy outwash, silty glacial till, and clayey glacial till are present. The lacustrine clay and the lower outwash sand tend to pinch out at the base of Hartwells Hill, leaving a single unconsolidated lacustrine sand aquifer overlying the glacial till and bedrock on the hill. Groundwater flow is primarily to the north-northwest towards Elm Brook, which has its headwaters 4 miles upstream (west) of NWIRP Bedford.

A conceptual site model (CSM) depicts Site 4 conditions illustrating contaminant sources, release mechanisms, transport mechanisms, exposure pathways, and potential human and ecological receptors (Figure 7). The CSM summarizes current and potential future site conditions and shows what is known about human and environmental exposure through contaminant release and migration to potential receptors. The risk assessments and selected response action are based on this CSM.

As part of the RI, soil, sediment, surface water, and groundwater samples were collected to determine the nature and extent of contamination resulting from Site 4 (Figures 8 and 9). In general, soil sampling was performed to assess surface, shallow subsurface, and deeper subsurface conditions and to characterize chemical distribution within the soil; groundwater monitoring wells were installed to assess groundwater conditions beneath Site 4; and sediment and surface water samples were collected from Elm Brook to evaluate any impacts from Site 4 on the Brook. Some non-aqueous phase liquid (NAPL) may be present at Site 4 based on a sheen observed in monitoring well MW-18 during the Phase II RI. In 1998, the Navy conducted a Supplemental Investigation which included five soil borings in the vicinity of MW-18 (TtNUS 1999). Two borings were located downgradient of the source area, one boring was located to the west of the source area, one boring was located to the east and slightly downgradient of the source area, and one soil boring was located near the former UST. NAPL was not encountered in any of the soil borings and it was concluded that NAPL, if present, would be limited to the area within the ring of soil borings. The extent of this area was approximately 50 by 100 feet around MW-18 and was henceforth referred to as the Site 4 source area.

Table 1A summarizes the analytical dataset obtained from the environmental sampling during the RI (1990s) and which was used in the human health and ecological risk assessments for Site 4. Since that time, chemical concentrations have been reduced through two source area removal actions (2000 to 2003; see Section II.C) and natural attenuation processes. Table 1B summarizes the analytical dataset for groundwater from the March 2009 sampling event.

## **VI. CURRENT AND POTENTIAL FUTURE SITE USES**

Operations at NWIRP Bedford were conducted from the mid-1950s through Raytheon's departure in December 2000. Since Raytheon's departure from the facility, the facility has remained vacant. NWIRP Bedford is an industrial area that is fenced and gated to control access. The current adjacent and surrounding land uses to NWIRP Bedford are both industrial and residential in nature. NWIRP Bedford is abutted to the west and north by undeveloped woodland and wetland areas. The Town Zoning for the majority of the NWIRP Bedford property is "Industrial Park (A)." The area north of the Components Laboratory and offsite wetland area included within Site 4 is zoned as "Residential B."

Reuse plans for the facility are currently being prepared under the direction of the Naval Sea Systems Command (NAVSEA) and will likely involve property transfer because the Navy considers the property to be

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excess. The reasonably foreseeable future use of Site 4, NWIRP Bedford, and surrounding areas is expected to be similar to the current use pattern (i.e., industrial on the NWIRP property and a mix of industrial and residential uses in the surrounding areas).

The groundwater at Site 4 is classified with MassDEP groundwater protection designations "Zone II" and "Zone III" (see Glossary in Appendix C). At NWIRP Bedford, a portion of the aquifer contributes to the Hartwell Road municipal water supply wellfield located to the northwest (Figure 1). The wellfield contains three wells, which were closed in 1984. However, although this wellfield remains inactive, it has not been officially abandoned under MassDEP regulations, and the Town of Bedford has contingency plans to reactivate the wells sometime in the future.

In 1997 the Town of Bedford adopted a bylaw to establish an Aquifer Protection District (APD), designating the groundwater beneath NWIRP Bedford as a potential drinking water source area. In 1998, the MassDEP determined that the aquifer underlying Site 4 is of "high use and value" (Appendix G).

## **VII. SUMMARY OF SITE RISKS**

A baseline human health and ecological risk assessment was conducted for NWIRP Bedford for the Phase II RI in 1996 (TtNUS, 2000b). One specific area evaluated in the RI included the Transportation Building and vicinity (i.e., Site 4). In 2001, the baseline human health risk assessment (HHRA) was revisited, and an additional exposure pathway (use of groundwater for drinking) was evaluated and discussed in the Addendum to the Site 4 FS (TtNUS, 2001b). The overall baseline risk assessment conducted during both studies evaluated many exposure pathways, including both current and reasonably expected future exposure scenarios. Specifically, the baseline risk assessment was performed to estimate the probability and magnitude of potential adverse human health and ecological effects from exposure to compounds associated with Site 4 if no remedial actions were taken. The assessment provides the basis for taking action, and identifies the compounds and exposure pathways that need to be addressed by the selected remedy, if necessary. Two removal actions, in-situ chemical oxidation (2000 – 2002) and in-situ thermal treatment (2003 – 2004), occurred after these risk assessments were conducted. Therefore, the following risk assessments do not reflect current conditions; rather, they represent a worst case scenario.

### **A. Human Health Risk Assessment**

The HHRA followed a four-step process: 1) Hazard Identification; 2) Toxicity Assessment; 3) Exposure Assessment; and 4) Risk Characterization. The 1996 HHRA evaluated both current and reasonably expected future exposure scenarios. Subsequent to the 1996 HHRA, the Town of Bedford adopted a bylaw to establish an APD for the NWIRP Bedford area, and the aquifer at the facility ultimately received a groundwater use and value determination (GUVD) of "high use and value". To account for the change in aquifer classification that occurred since completion of the HHRA, the Navy conducted an additional evaluation of potential risks that could theoretically be posed by exposure to groundwater (i.e., use of groundwater for drinking) underlying Site 4 (TtNUS, 2001b). The description in this ROD summarizes both the 1996 HHRA and the 2001 addendum.

Potential human health effects associated with exposure to chemicals of potential concern (COPCs) were estimated quantitatively or qualitatively through several hypothetical exposure pathways. These pathways were developed to reflect the potential for human exposure to COPCs based on current use of the land, potential future uses, and location of Site 4. On-site worker, construction worker, trespassing teenager, and on-site and off-site resident scenarios were evaluated. The following potential exposure points were considered: on-site indoor air, off-site indoor air, off-site surface soil, on-site surface soil, on-site subsurface soil, surface water, sediment, off-site groundwater, and on-site groundwater. The vapor intrusion pathway was qualitatively assessed in the HHRA Addendum, but was not quantitatively analyzed, because it was assumed that this pathway would be minor compared to the ingestion pathway.

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Only those media that present a potential risk or level of concern, or which are the focus of remedial efforts are discussed in this ROD (i.e., soil and groundwater). The COPCs selected for the overall HHRA are provided in Table 2. The COPCs were selected to represent potential risks associated with Site 4 based on toxicity, concentration, frequency of detection, and mobility and persistence in the environment. Table 2 also contains the exposure point concentrations (EPCs) used in the HHRA to evaluate the reasonable maximum exposure (RME) scenarios for COPCs. EPCs consist of both modeled and measured concentrations:

- Modeled concentrations were used as EPCs for certain COPCs (i.e., VOCs) when evaluating the migration of groundwater from NWIRP Bedford to the Hartwell Road municipal wellfield or to residential wells in the neighborhood northeast of the facility. These pathways were evaluated through development and use of a groundwater fate and transport model presented in Appendix C of the Phase II RI (TtNUS, 2000b). The model was developed to predict concentrations of VOCs from NWIRP Bedford that would migrate to the Hartwell Road wellfield or the residential wells in the northeast neighborhood under the peak pumping conditions.
- Measured concentrations were used as EPCs for semi-volatile organic compounds (SVOC) and inorganic COPCs when evaluating the migration of groundwater from NWIRP Bedford to the Hartwell Road municipal wellfield or to residential wells in the neighborhood northeast of the facility. In other words, on-site analytical data were used as surrogate values for the off-site exposure of humans to these particular COPCs. This is because it was not possible to model concentrations of SVOC or inorganics at the wellfield or residential wells because no clear source areas were identified for these compounds.
- Finally, measured data were used as EPCs for all other current and future exposure scenarios for on-site soil and groundwater, and Elm Brook sediment and surface water.

Estimates of average or central tendency case (CTC) EPCs for COPCs were calculated for the Phase II RI, and can be found in Tables 5-22, 5-27, 5-33 and 5-34 of that report (TtNUS, 2000b). The CTC was not evaluated for the hypothetical future on-site use of groundwater as a drinking water source.

Prior to estimating the potential risks, average daily doses of COPCs were estimated using conservative assumptions relative to the rates of potential contact with soil or groundwater, the frequency and duration of contact, and other parameters. Exposure assumptions are presented in Table 5-16 in the Phase II RI report (TtNUS, 2000b) and Table 1-4 in the Addendum to the Site 4 Feasibility Study (TtNUS, 2001b).

The results of the exposure assessment are combined with the results of the toxicity assessment to derive pathway-specific quantitative estimates of potential health risks. The estimates for each exposure pathway are then summed to give total risk estimates for each pathway. Separate quantitative estimates of potential risk are derived for carcinogenic and non-carcinogenic effects. A summary of the potential carcinogenic toxicity data relevant to the COPCs is presented in Table 3. A summary of the potential non-carcinogenic toxicity data relevant to the COPCs is presented in Table 4. Table 5 summarizes the human health risks associated with exposure to COPCs in soil and groundwater for current and potential future site uses under the RME scenario.

The HHRA (TtNUS, 2000b) concluded that for receptor exposure to soil, adverse human health effects were not anticipated. Estimated cancer risks evaluated for trespassing teenagers, on-site workers, and construction workers were within the EPA acceptable risk range of  $1 \times 10^{-6}$  to  $1 \times 10^{-4}$ , and estimated non-cancer risks were below the Hazard Index of 1. The assessment of adult and teenage resident exposure to groundwater at the Hartwell Road municipal wells and nearby residential wells showed a potential cancer risk above the EPA acceptable risk range; however, the primary chemicals associated with the predicted risks (arsenic and beryllium) were not attributed to activities associated with Site 4. Sampling data collected for the RI did not indicate a specific source or plume of metals and the RI concluded that metals detected in Site 4 groundwater were most likely naturally occurring or associated with sediments entrained in the samples, rather than derived from historic waste handling practices at NWIRP Bedford (TtNUS, 2000b). Further, the arithmetic mean concentrations of total arsenic (7.56 ug/L) and total beryllium (0.72 ug/L) at NWIRP Bedford do not exceed maximum contaminant levels (MCLs) for drinking water (10 ug/L and 4 ug/L, respectively).

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Therefore, the 2000 risk assessment concluded that no site-related risks exceeded regulatory risk thresholds. The 2001 risk assessment addendum for exposure to groundwater at Site 4 (TtNUS, 2001b) indicated that the total estimated carcinogenic risk level for potential future on-site residents is greater than the EPA acceptable risk range of  $1 \times 10^{-6}$  to  $1 \times 10^{-4}$ . Benzene was the sole contributor to the potential excess cancer risk estimate. The non-cancer hazard index estimate for Site 4 groundwater also exceeded the EPA acceptable level of 1. Much of the predicted excess non-cancer risk was associated with exposure to 2-methylnaphthalene, benzene, ethylbenzene, and toluene in groundwater. The individual HQs for these chemicals were above 1.

The risk assessment uses assumptions that have associated uncertainties. Regulatory risk assessment methodology dictates that assumptions err on the side of overestimating potential exposure and toxicity. Such estimates may be useful for regulatory decision-making, but do not provide a realistic estimate of potential health impacts. The effects of using numerous assumptions that each over-estimate potential exposure and toxicity is to exaggerate estimates of potential human risk. In addition, two removal actions have been conducted after these risk assessments were completed. Therefore, the pre-cleanup risk assessments presented herein over-estimate the current risks associated with Site 4.

**B. Ecological Risk Assessment**

The ecological risk assessment (ERA) evaluated potential risks to ecological receptors that may occur in the presence of chemical stressors in environmental media. The ERA was completed in three steps: (1) Problem Formulation, (2) Risk Analysis, and (3) Risk Characterization. The COPCs used in the ERA are presented in Table 6.

The ecological receptor groups evaluated included terrestrial vertebrates (e.g., small mammals, birds), terrestrial invertebrates (e.g., earthworms), terrestrial plants (e.g., ruderal growth vegetation such as weeds and early successional species), and aquatic life. The ecological exposure pathways evaluated included direct contact with and/or ingestion of surface soil by terrestrial invertebrates; direct contact with surface soil by terrestrial plants; wildlife ingestion of food items that are potentially contaminated as a result of accumulation of constituents from surface soil; incidental ingestion of surface soil by wildlife; and direct contact, ingestion and/or respiration of aquatic media (wetland, sediment, surface water, runoff/seepage, and groundwater discharge) by aquatic life. The exposure pathways used in the ERA are presented in Table 7. The ERA completed for NWIRP Bedford concluded that there is a very low potential for ecological risks at NWIRP Bedford (i.e., no unacceptable ecological risks were identified).

Similar to the HHRA, the ERA used assumptions that have associated uncertainties, which influence the results and conclusions of the risk assessment. Some of the assumptions may underestimate potential risk, some have an unknown effect on potential risk, while some assumptions tend to over-estimate potential risk. Also, two removal actions have been conducted since this risk assessment was completed; therefore, the ERA is an over-estimate of the actual current ecological risks at Site 4.

**C. Basis for Response Action**

In summary, the HHRA indicated that potential risks would exceed both carcinogenic and non-carcinogenic regulatory risk thresholds if, in the future, groundwater within the plume were to be used as drinking water. The potential carcinogenic risk was based on the presence of benzene, and the non-carcinogenic risk was based on the presence of 2-methylnaphthalene, benzene, ethylbenzene, and toluene in groundwater. The ecological risk assessment concluded that there is a very low potential for ecological risks at NWIRP Bedford. No other human health or ecological risks were identified for the current and future use scenarios evaluated for Site 4. As a result of these findings, the Navy conducted two source area treatments to reduce COC concentrations in groundwater (Section II.C). Subsequent monitoring results indicate that residual COCs remain in groundwater above cleanup goals. It is believed that residual constituents trapped in source area soil are contributing to the elevated groundwater COCs concentrations in that area.

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**D. Principal Threat Wastes**

Principal threat wastes are those source materials considered to be highly toxic or highly mobile which generally cannot be contained in a reliable manner or would present a significant risk to human health or the environment should exposure occur. The manner in which principal threats are addressed generally will determine whether the statutory preference for treatment as a principal element is satisfied. Wastes generally considered to be principal threats are liquid, mobile and/or highly-toxic source material. By definition, and based upon site characteristics and the site-specific risk assessment performed, benzene, toluene, ethylbenzene, and 2-methylnaphthalene in the source area may be considered a principal threat waste at Site 4.

Low-level threat wastes are those source materials that generally can be reliably contained and that would present only a low risk in the event of exposure. Wastes that generally are considered to be low-level threat wastes include non-mobile contaminated source material of low to moderate toxicity, surface soil containing COCs that are relatively immobile in air or groundwater, low leachability contaminants or low toxicity source material. By definition, and based upon the site characteristics and the site-specific risk assessment performed, benzene, toluene, ethylbenzene, and 2-methylnaphthalene in the groundwater plume area may be considered as a low-level threat waste at Site 4.

**VIII. REMEDIAL ACTION OBJECTIVES**

Remedial Action Objectives (RAOs) are media-specific goals that are established to protect human health and the environment. RAOs are typically based on COCs, exposure pathways, and receptors present or available at Site 4. Additionally, RAOs are developed to ensure compliance with federal and state Applicable or Relevant and Appropriate Requirements (ARARs). The RAOs for Site 4 were developed considering the CSM and the results of the risk assessment.

Based on the information relating to types of contaminants, environmental media of concern, and potential exposure pathways, the following RAOs were developed to mitigate, restore and/or prevent potential threats to human health, and comply with ARARs:

- Eliminate potential future risks to humans using groundwater from Site 4 as a drinking water supply by restoring the aquifer to drinking water quality by reducing COC concentrations to below federal and state maximum contaminant levels (MCLs) and federal non-zero maximum contaminant level goals (MCLGs), or, if an MCL or MCLG is not available for a chemical, reducing COC concentrations to below a site-specific risk-based cleanup level.
- Minimize or eliminate the migration of COCs from the source area to the groundwater plume by reducing COC concentrations in the source area.

Table 8 presents the COCs for Site 4 and their respective federal or state drinking water standard (if available). Cleanup goals for Site 4 groundwater were defined as the MCLs or non-zero MCLGs. For those COCs for which a drinking water MCL has not been promulgated (i.e., 2-methylnaphthalene), a risk-based value was selected.

The risk assessment identified no unacceptable risks associated with soil; therefore, there is no risk-based trigger for soil remediation at Site 4. However, the ongoing monitoring data suggest that natural attenuation processes for dissolved-phase COCs in groundwater may be slowed by the presence of residual COCs in source area soil. Therefore, the selected remedy includes additional source area excavation, to be determined based on pre-design sampling results, in order to allow for the successful natural attenuation of COC concentrations in groundwater. Since no chemical-specific ARARs are identified for soil cleanup goals, the Massachusetts Contingency Plan (MCP) Method 1 soil standards, which are generic risk-based cleanup standards, will be used to help delineate source area soils and to guide excavation activities at Site 4. In addition, land use restrictions will be established to prevent exposure to contaminated groundwater until

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cleanup levels are achieved.

In accordance with Table 40.933(9) of the MCP, S-2/GW-1 values will be used to delineate source area soils warranting removal in this low frequency exposure area for soil 3 to 15 feet bgs. MCP S-3/GW-1 values will be used to delineate source area soils warranting removal at depths greater than 15 feet bgs. Soil used as post-excavation backfill for the top 3 feet will not exceed MCP S-1/GW-1 standards. These values are summarized in Table 9.

#### **IX. DESCRIPTION OF REMEDIAL ALTERNATIVES**

To address COCs in groundwater, a screening of General Response Actions, remedial technologies, and process options was conducted as part of the FS (TtNUS, 2001a) and FS Addendum (TtNUS, 2008a). From the options retained from this screening, various remedial alternatives were developed for source control (SC) options and migration management (MM) options. Table 10 provides the major components, details, and cost of each SC and MM option. Based on combinations of the SC and MM options, the following site-wide remedial alternatives were retained for detailed analysis.

<b>Site-Wide Alternative</b>	<b>Source Control (SC)</b>	<b>Migration Management (MM)</b>
1	No Further Action	No Further Action
2	Pump-and-Treat	Pump-and-Treat
3	Pump-and-Treat	Monitored Natural Attenuation
4	In-situ Chemical Oxidation	Monitored Natural Attenuation
5	In-situ Thermal Treatment	Monitored Natural Attenuation
6	In-situ Chemical Oxidation	Pump-and-Treat
7	In-situ Thermal Treatment	Pump-and-Treat
8	In-situ Chemical Oxidation	Enhanced Bioremediation
9	In-situ Thermal Treatment	Enhanced Bioremediation
10	Excavation	Monitored Natural Attenuation

#### **X. SUMMARY OF THE COMPARATIVE ANALYSIS OF ALTERNATIVES**

A detailed analysis was performed on the remedial alternatives using the nine NCP evaluation criteria to select a remedy. Following the detailed analysis of each individual alternative, a comparative analysis, focusing on the relative performance of each alternative against the nine criteria, was conducted. This comparative analysis is summarized in Table 11 and is described below.

##### **Overall Protection of Human Health and the Environment**

Alternative 1 is not considered protective because no further actions would be taken to mitigate the risks associated with exposure to groundwater COCs. Natural attenuation processes would continue to reduce COC concentrations over time, but no monitoring would be conducted to verify this and no interim controls would be enacted to control groundwater use in the interim.

Alternatives 2 and 3 are considered protective, in that COCs would be prevented from migrating from the source area and downgradient (off-property) groundwater quality would be restored. However, using extraction wells at the downgradient edge of the source area to prevent COC migration is considered less protective than Alternatives 4 through 10 which include direct removal/treatment technologies to restore the source area groundwater quality. Accordingly, Alternatives 4 through 10 are considered to be more protective of human health and the environment than Alternatives 2 and 3. The degrees of protectiveness between Alternatives 4 through 10 are roughly equivalent given that each of these alternatives would remediate the source area and downgradient plume and would prevent exposure to site COCs.

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Protection of current human health is afforded by existing facility restrictions (Navy ownership and control of this inactive facility) and the Town of Bedford Code of Health Regulations which restrict the installation and use of private wells for consumption or irrigation. No water supply wells are currently onsite. As part of implementing institutional controls under Alternatives 2 through 10 to protect current and future human health, the Navy will confirm that either the current local ordinance remains in effect or any future remedy remains protective of human health. Therefore, institutional controls will be equally effective for protecting human health and the environment under Alternatives 2 through 10.

#### **Compliance with ARARs**

Alternative 1 would not achieve chemical-specific ARARs because no further actions would be taken to reduce COC concentrations (and no monitoring would be conducted to verify the effectiveness of natural attenuation processes).

Alternatives 4 through 10 would comply with chemical-specific ARARs in that COC concentrations would be reduced until remedial goals are achieved. A groundwater model conducted for the 2001 FS (TtNUS 2001a) indicated that the SC portions of Alternatives 2 and 3 (pump-and-treat) may not be effective for achieving cleanup goals in the source area. However, since that time, the Navy has completed two removal actions which greatly reduced source area COC concentrations and which may augment the pump-and-treat aspect of Alternatives 2 and 3. Therefore, due to the uncertain success of a pump-and-treat system at the Site 4 source area, Alternatives 2 and 3 may only partially meet chemical-specific ARARs.

Alternatives 2 through 10 would be designed and conducted in accordance with location- and action-specific ARARs. The MM portions of Alternatives 6 and 7 (pump-and-treat) may require additional coordination and efforts to minimize potential adverse impacts to the off-property wetland area through dewatering. No location- or action-specific ARARs were identified for Alternative 1.

#### **Long Term Effectiveness and Permanence**

Alternative 1 would not be protective in the long-term because no further actions or monitoring would be conducted to ensure the protection of human health and the environment.

Alternatives 5, 7, 9, and 10 would be the most effective and permanent in the long-term because the SC components (ERH or excavation) would be highly effective for reducing source area COC concentrations and allowing the MM components to mitigate the residual COC plume on similar timeframes. Alternatives 4, 6, and 8 would also reduce COC concentrations; however, the SC component (ISCO) may be less effective than the other alternatives given that three rounds of oxidant injection have already been implemented as part of the 2000-2002 removal action (see Section II.C) and they did not achieve remedial goals throughout the treatment area. Alternatives 2 and 3 may have limited effectiveness for capturing all source area COCs given the high soil heterogeneity and low soil permeability.

The institutional controls implemented under Alternatives 2 through 10 would be equally effective and permanent for preventing groundwater use during the interim time until groundwater cleanup goals are achieved.

#### **Reduction of Toxicity, Mobility, and Volume of Contaminants through Treatment**

No further treatment is specified under Alternative 1. Although natural attenuation processes would continue to reduce COC concentrations over time, no monitoring would be conducted to verify the reduction of COC toxicity, mobility, or volume.

Alternatives 2 through 10 each specify some form of treatment to reduce the toxicity, mobility, and/or volume of COCs in groundwater. Alternative 2 would provide the greatest reduction in plume mobility through the use of extraction wells in both the source and downgradient areas. However, the pump and treat process itself

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does not destroy hazardous materials, rather it transfers them to another medium (e.g., granular activated carbon [GAC]), which then becomes a treatment residual to be handled accordingly. Thermal treatment under Alternatives 5, 7, and 9 would also transfer COCs to another media (vapor capture and treatment system).

Implementation of Alternatives 4, 6, and 8 would detoxify and/or destroy the source area COCs due to implementation of ISCO in this area. Therefore, the toxicity, mobility, and volume of source area contamination will be greatly reduced. Alternative 10 would only include treatment if ex-situ biodegradation (biopiles), treatment of excavation water, and/or addition of oxygen-releasing compounds to the excavation area (for enhanced bioremediation) is used as a component of the remedy.

For the downgradient (off-property) area, Alternatives 8 and 9 offer the greatest degree of COC treatment (enhanced biodegradation). Alternatives 3, 4, 5, and 10 do not include active treatment for the downgradient COCs, although MNA would reduce the toxicity, mobility, and volume of COCs over time. Alternatives 2, 6, and 7 reduce the mobility of dissolved phase COCs in the downgradient area via pump-and-treat and include ex-situ treatment via GAC adsorption.

### **Short-term Effectiveness**

Although no new risks to site workers or the community are associated with its implementation, Alternative 1 would not be protective in the short term because no further actions or monitoring would be conducted to ensure that RAOs are achieved for the protection of human health and the environment.

Based on each alternative's potential for success, Alternatives 5, 7, 9, and 10 would be the most effective in the short term for achieving RAOs through the use of comparatively rapid source area remediation techniques.

Alternative 9 may achieve RAOs the fastest overall through use of active treatment techniques both in the source area and in the downgradient plume area. Active source area treatment under Alternatives 5, 7, and 10 would help to expedite the overall site restoration. Alternatives 4, 6, and 8 also specify source area treatment; however, this treatment technology (ISCO) has already been implemented at Site 4 with only partial success. Alternatives 2 and 3, which specify source area pump-and-treat, would have the longest time to achieve RAOs due to the difficulty in recovering COCs in the heterogeneous, low permeability soil.

Potential new risks to site workers or the community associated with implementing Alternatives 2 through 10 would be low and could be mitigated with proper safety controls. The HHRA evaluated risk to construction workers from exposure to surface and subsurface soils from 0 feet to 10 feet below ground surface. No adverse human health effects were anticipated for the top 10 feet of soil, but Alternative 10 would involve remediation workers excavating and potentially coming into direct contact with soils below this depth interval. As a precaution, engineering controls (e.g., dust suppression and erosion controls) would be employed and site workers would be required to use personal protective equipment. Alternatives 4, 6, and 8, which include ISCO treatment, would require safety measures during the transport, temporary storage, and use of large volumes of oxidizing chemicals onsite. Under Alternative 10, the oxygen-releasing compounds potentially to be used following excavation would be of a lesser risk to remediation workers than the oxidizing chemicals used for ISCO under Alternatives 4, 6, and 8; however, in any case, a Health and Safety plan would be developed and appropriate personal protective equipment will be used to protect remediation workers from potential short-term risks.

### **Implementability**

In a technical sense, Alternative 1 would be the easiest to implement because no further actions would be required; however, this alternative could not be implemented in an administrative sense because it does not satisfy threshold criteria.

With respect to coordination with other agencies, Alternatives 2, 6, 7, 8, and 9 would be more difficult to implement than Alternatives 3, 4, 5, and 10 because they include active treatment technologies on non-Navy property and adjacent to delineated wetlands. Property access agreements would need to be developed and

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approved by the Navy and the other property trustee(s). Following source area treatment, Alternatives 3, 4, 5, and 10 would effectively mitigate off-property COCs through natural attenuation processes which would only require off-property monitoring efforts by the Navy.

The required vendors and services are available to implement Alternatives 2 through 10, although proprietary technologies or specialized vendors may be required for ISCO (Alternatives 4, 6, 8) and thermal treatment (Alternatives 5, 7, 9) as compared to the more readily-available pump and treat (Alternatives 2, 3) and excavation (Alternative 10) technologies.

Alternatives 2 through 10 each would have potential technical challenges to overcome. Pump-and-treat (Alternative 2, 3) would be complicated by the heterogeneous, low-permeability soil, although groundwater treatment could be facilitated by the existing groundwater treatment system in-place for Site 3 (additional treatment capacity is available). A flow model conducted prior to the removal actions (TtNUS, 2001a) indicated that pump-and-treat may not be effective for capturing all source area COCs. ISCO and thermal treatments have been previously implemented at Site 4 (see Section II.C) with different levels of success due to the soil heterogeneity (ISCO treatment) and the intensive energy requirements (thermal treatment). The construction associated with enhanced bioremediation (Alternatives 8 and 9) is the installation of the monitoring well network, which would utilize common/proven techniques already implemented at Site 4 during investigation activities. However, a pilot scale field program may be required to determine the suitability of full-scale enhanced bioremediation at Site 4. Alternative 10 would be complicated depending on the proximity of the excavation to existing structures (i.e., the Antenna Range Building). The current delineation is based on soil samples collected prior to the removal actions (Section II.C); therefore, Alternative 10 includes a pre-design investigation to confirm the soil volume warranting removal. It is expected that the current source area delineation will be smaller than the pre-removal action delineation; therefore, less volume and shoring may be required. If selected under Alternative 10, biopile treatment would be readily implementable. Biopiles are a well-proven technology for the treatment of BTEX in soil. There is sufficient space available for onsite treatment of excavation soils and the required equipment and services are available. The decision to conduct ex-situ biopiling versus offsite disposal will be based on a cost-benefit analysis at that time (e.g., depending on the soil composition and current market rates).

Institutional controls included under Alternatives 2 through 10 would be implemented on both Navy and non-Navy property. Implementation of institutional controls on currently owned Navy property will be relatively easy, by developing a Navy Instruction which includes a restriction on the use Site 4 groundwater until the RAOs are achieved and a restriction on site redevelopment (including occupancy of site structures) pending a supplemental risk assessment that determines there are no unacceptable risks. Institutional controls on non-Navy property will be implementable through coordination with the Town of Bedford for enforcement of the Town's Code of Health Regulations regarding new water wells (Appendix H).

### **Cost**

The present worth cost estimates for each alternative are summarized in Table 11. The costs shown are conservative and are likely to be less because the Navy has already completed two source area removal actions (Section II.C).

### **State Acceptance**

The MassDEP statement on the selected remedy is presented in Appendix A.

### **Community Acceptance**

Based on the comments received during the June-July 2009 Public Comment Period on the Proposed Plan, the community expressed support for the Selected Remedy (Appendices E.3 and E.4).

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**XI. THE SELECTED REMEDY**

**A. Rationale for Selected Remedy**

The selected remedy is a comprehensive remedy that utilizes SC and MM components to address potential Site 4 risks. The selected remedy (Alternative 10) consists of excavation and biopile treatment or off-site disposal of soil in the source area; MNA of the groundwater plume; interim institutional controls restricting groundwater use, residential development, and occupancy of site structures; and five-year reviews. This remedy is comprehensive and addresses the principal site risks and the RAOs established for Site 4.

The selected remedy is recommended because (1) it will be protective of human health and the environment; (2) it will comply with all pertinent state and federal regulations; (3) it will be cost-effective; (4) it will use permanent solutions to the maximum extent practicable; and (5) uses treatment as a principal element, to the extent practicable. The available monitoring data and MNA evaluations indicate that natural attenuation is occurring at Site 4 to reduce COC concentrations but that additional remediation is warranted in the source area to mitigate residual COCs that continues to act as a source for elevated groundwater concentrations. Additional excavation of the source area will remove the residual COCs trapped in soil, thereby allowing natural attenuation processes in groundwater to achieve remediation goals within 5 to 10 years.

**B. Description of Remedial Components**

The selected remedy, Alternative 10, would address residual COCs in source area soils through excavation and treatment/disposal and would address residual COC concentrations in groundwater through MNA. The selected remedy includes the following components:

- Pre-Design Investigation
- Excavation of soil containing elevated COC concentrations
- On-site treatment of excavated soil in biopile(s) (or offsite disposal as appropriate)
- Onsite treatment and discharge of water from the excavation (if soil dewatering is required) via the existing groundwater treatment system
- Potential application of enhanced bioremediation in the excavated source area
- Monitored Natural Attenuation of COCs in groundwater
- Institutional Controls
- Five-Year reviews

These components are described below.

**Pre-Design Investigation**

Since the current source area delineation is based on pre-removal action data, the selected remedy includes a pre-design investigation intended to further delineate the extent of soil to be excavated. The proposed pre-design investigation would consist of one additional sampling round that includes a grid of soil borings at the previously delineated source area, with soil samples collected at the water table and capillary fringe. A combination of jar headspace analysis and laboratory sample results compared to MCP Method 1 standards for category S-2/GW-1 or S-3/GW-1 soils will be used as a guideline to delineate the extent of the source area warranting excavation. The results will also be considered in the design of the ex-situ treatment process. Details of the pre-design investigation (e.g., number of samples and location of sampling grid) would be developed in coordination with the regulatory agencies during the Remedial Design phase following the ROD.

A bench-scale treatability study would be conducted in order to assist in the design of the ex-situ biopile treatment system and to evaluate the likely effectiveness of the full-scale system to degrade the target contaminants in soil. This study would need to evaluate soil characteristics (i.e. soil chemistry, microorganism presence, limiting nutrients) and would include tests to evaluate requirements for implementing an effective, full-scale biopile remedy. If the treatability study results show that the soil is not a good candidate for

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remediation by this method, then the soil would be sent to an off-site licensed, treatment, storage, recycling, or disposal facility after it is excavated.

### **Excavation**

This alternative includes the excavation of soil with the intent of removing residual contamination that is believed to be providing a continuing source of COCs to Site 4 groundwater. The area for excavation will be determined based on the results of the pre-design investigation conducted as part of the design phase. For costing purposes, the original source area delineation is assumed as a conservative measure. Given that two source area removal actions have been completed, the actual extent of excavation is expected to be less.

The potential total volume of soil warranting removal based on COC concentrations detected prior to the two removal actions may exceed 2,000 cubic yards (CY). The extent of the source area was estimated during previous investigations as an approximate 50 foot by 100 foot area (Figure 10). Although soil directly beneath and immediately surrounding the former UST was excavated during tank removal, it is likely that fuel-impacted soil (and hence, soil possibly containing NAPL) remains within the zone of water table fluctuation, the capillary fringe zone, and a thin band of vadose zone soil under the footprint of the former Transportation Building which was not removed during removal of the UST. The water table fluctuation in this area is approximately plus or minus 1.5 feet along with a capillary fringe zone assumed to be approximately 3 feet. Accordingly, the vertical extent of source area soil at the water table was estimated to be 6 feet thick over the 50 foot by 100 foot area. Excavation may be continued deeper into the saturated zone (e.g., 25 ft bgs) due to past investigation data and a reported strong petroleum odor and black material (assumed to be fuel) at a depth of 18 to 20 feet on saturated soils from the soil boring at monitoring well MW-44. Additionally, it is assumed that a band of vadose zone soil, potentially containing NAPL, lies underneath the former Transportation Building. This vertical band was assumed to lie beneath the top of the tank (i.e., 3 feet bgs) and to the bottom of the water table fluctuation zone (20 feet bgs). If a layer of NAPL is present on the water table within the excavation area, it will be removed and properly disposed off-site.

Conceptually, it is expected that the upper 14 feet of soil (i.e., above the capillary fringe zone) will not exceed cleanup goals and, as such, would be segregated and retained for backfilling, while soil from the 14 to 20 ft depth interval would be placed in the biopile(s) for treatment (or disposed off-site if deemed appropriate based on pre-design investigation results).

If the results of the pre-design sampling show that excavation near the Antenna Range Building is necessary (as suggested by the pre-removal action delineation of the source area), then it would be necessary to support the corner of the Antenna Range Building using sheet piling in order to excavate. The other sides of the excavation would use sidewalls sloped at a 1:1 ratio.

Dewatering of the excavation is likely to be required. It is assumed that such water can be disposed through the existing groundwater treatment system at NWIRP Bedford (BTEX is amenable to removal via the granular activated carbon adsorption system used at the existing Site 3 treatment plant). Conducting the excavation during a dry season may help to reduce the amount of dewatering required. The Site 3 groundwater treatment plant consists of a pre-treatment system to remove dissolved and suspended inorganic material followed by granular activated carbon (GAC) adsorption. Treated groundwater is discharged to the side of Hartwells Hill where it percolates back into the ground.

The impacted soil would be excavated using a track-mounted excavator and would be temporarily stockpiled on-site in the adjacent, paved areas. Erosion controls (e.g., silt fences, hay bales) would be used around the work area to protect adjacent areas. Stockpiled soil would be placed on 10-mil polyethylene sheeting to prevent potential COC migration. To prevent infiltration of rain water and erosion/runoff from the soil pile, the stockpiles will be covered with 10-mil polyethylene sheeting at all times except when materials are being added or removed. Engineering controls (e.g., dust suppression and erosion controls) would be employed and site workers would be required to use personal protective equipment during remedial excavation activities.

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due to the disturbance and handling of COC-impacted soil. A staging area would be required for the temporary soil stockpile(s) and control of fugitive dust may be necessary.

Warning tape or temporary fencing would be installed around the perimeter of the excavated area(s) to prevent access until the area is backfilled and restored. Prior to backfilling the soil, a stabilization layer would be placed in the bottom of the excavation.

#### **Treatment of Excavation Water**

Dewatering of the excavation area may be required. It is anticipated that such water can be disposed through the existing groundwater treatment system at NWIRP Bedford because BTEX is amenable to removal via the granular activated carbon adsorption system at the treatment plant. Conducting the excavation during a dry season may help to reduce the amount of dewatering required. The Site 3 groundwater treatment plant consists of a pre-treatment system to remove dissolved and suspended inorganic material from the extracted water followed by VOC removal by GAC adsorption. Pre-treatment includes oxidation, chemical addition, settling, sludge filtering, and two stages of physical filtration, as needed. Treated groundwater is discharged to the side of Hartwells Hill where it percolates back into the ground before reaching Elm Brook.

#### **Potential Enhanced Bioremediation in the Excavation**

If appropriate based on sampling results, and if it does not conflict with remedial activities at nearby Site 3, an oxygen-releasing compound may be added to the bottom of the excavation prior to backfilling in order to augment the biodegradation of source area COCs in groundwater.

#### **Ex-situ Bioremediation (Biopiles) or Disposal**

Ex-situ bioremediation would be accomplished by promoting the activity of indigenous microbial populations in the soil. Depending on the results of the treatability study, this may include adding soil amendments such as water, limiting nutrients, oxygen-rich compounds, and/or secondary food sources. Soil amendments are usually aqueous solutions applied once or more often, if needed. The solution could also be introduced in smaller doses over controlled periods of time using spray irrigation from an on-site storage tank. Seeding with additional bacteria may be considered based on the results of the pre-design study, although this is often not required for effective biodegradation. Bioremediation will be conducted under aerobic conditions (in the presence of oxygen). Treatment using a biopile can range from 6 months to 2 years under optimal conditions. Following completion of bioremediation activities, the treated soil would be tested and, once clean, would be backfilled to the excavated area. MCP Method 1 standards will be used to guide the degree of soil remediation prior to backfilling.

#### **Monitored Natural Attenuation for Groundwater**

Under natural attenuation, naturally-occurring processes in soil and groundwater act without human intervention to reduce the mass, toxicity, volume, or concentration of COCs. When implementing MNA, periodic monitoring is the only direct human intervention required. Sampling and analysis must be conducted throughout the process to ensure that COC concentrations are continuing to decrease at an acceptable rate. The details of the monitoring program will be developed during the Remedial Design phase. The current monitoring well network is shown on Figure 10.

Under the monitoring program, the first two years would include semi-annual sampling of the groundwater monitoring well network. The results of the semi-annual monitoring program will be used to develop recommendations to enhance the understanding of site characterization, to recommend the appropriate frequency for long-term monitoring, and/or to enhance the monitoring well network for long-term monitoring. Conceptually, the monitoring program will include the installation of additional permanent monitoring wells, which will include wells installed along the centerline of the plume and wells placed on the lateral and terminal edges of the plume, thereby creating "lines of wells" perpendicular to the centerline axis of the plume.

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Additional monitoring wells will be installed downgradient of the plume to monitor the extent of the plume. Monitoring wells located in the source area which are destroyed during excavation may also need to be replaced, as needed to support the monitoring program. For purposes of this remedy evaluation, it is assumed that six monitoring wells will be installed to supplement the existing monitoring well network at Site 4. The actual number of wells and their locations will be determined during the Remedial Design phase. Temporary, direct-push well points may be used during the Remedial Design phase to help select locations for permanent well locations.

Parameters to be analyzed in groundwater include benzene, toluene, ethylbenzene, xylenes, naphthalene, and 2-methylnaphthalene (to document the contaminant attenuation at the field scale) as well as geochemical indicators such as dissolved oxygen, nitrate and nitrite, ferrous iron, sulfate, methane, carbon dioxide, and chloride (to provide geochemical evidence of biological degradation of COCs, including depleted electron acceptor and increased metabolic by-product concentrations). Benzene, toluene, ethylbenzene, and 2-methylnaphthalene are the primary contributors to the unacceptable risks associated with groundwater. Xylenes and naphthalene also are associated with the Site 4 release and will be included in the monitoring program to ensure that the groundwater concentrations achieve MCLs.

The scope of the monitoring program (e.g., frequency, number of locations, analytes) can be adjusted over time based on the data trends from previous sampling events. For costing purposes, it is assumed that the frequency of monitoring can be decreased to annual sampling after the first two years (i.e., the approximate timeframe for source area treatment to affect the downgradient area).

Monitoring and MNA evaluations will continue to occur until remediation goals are achieved. It is anticipated that, following source area excavation, MNA would achieve remediation goals within 5 to 10 years. Data reports will be produced summarizing the sampling results for each event.

#### **Institutional Controls**

As part of the selected remedy, the Navy will implement institutional controls to achieve the following land use control performance objectives which are consistent with the RI/FS for Site 4, the Proposed Plan presented to the community, and further discussions among the Navy, EPA, and MassDEP:

- Prohibit use of the Site 4 groundwater aquifer as a drinking water supply until groundwater COC concentrations achieve cleanup goals (see Section VIII).
- Prohibit residential redevelopment of the Site 4 property until a CERCLA risk assessment is performed to quantitatively demonstrate that Site 4 soil poses no unacceptable risks to future residents.
- Restrict occupancy of current and future Site 4 structures until a CERCLA risk assessment is performed to quantitatively demonstrate that vapor intrusion from Site 4 soil poses no unacceptable risks.

The Navy will maintain institutional controls at Site 4 until the concentrations of hazardous substances have been reduced to levels that allow for unlimited exposure and unrestricted use, as determined by the monitoring program that is part of the selected remedy. The extent of the institutional controls is shown on Figure 11. The institutional control boundaries can be further defined during the remedial design/remedial action based on the site conditions.

Institutional controls for the portion of Site 4 located on Navy property will consist of a Navy Instruction to be maintained by NAVSEA. The Instruction will be a Navy directive that prescribes authority and assigns responsibility for compliance with the institutional controls and will be enforced through the designated Navy chain-of-command. In the event of property transfer, the institutional controls will be incorporated into a deed restriction. Any deeds or leases will have a description of the residual contamination on the property and the

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environmental use restrictions, expressly prohibiting activities inconsistent with the performance measure goals and objectives. Each deed or lease will contain a reservation of access to the property for the Navy, EPA, and MassDEP, and their respective officials, agents, employees, contractors, and subcontractors for purposes consistent with the Navy Installation Restoration (IR) Program and the FFA. The deed or lease will contain appropriate provisions to ensure that the restrictions continue and are enforceable by the Navy. Concurrent with the transfer of fee title from the Navy to transferee, information regarding the environmental use restrictions and controls will be communicated in writing to the property owners and to appropriate state and local agencies to ensure such agencies can factor such conditions into their oversight and decision-making activities regarding the property. For the portion of Site 4 not on Navy property, the Navy will continue to coordinate with the Town of Bedford Board of Health to implement the municipal Code of Health Regulations which controls the installation and use of drinking water wells (see Appendix H). Currently, the affected non-Navy property is not developed, has no groundwater extraction wells, and is situated near delineated wetlands.

As part of the short- and long-term implementation actions at Site 4, the Navy will:

- Conduct annual inspections of the institutional controls, and provide an annual report to EPA, MassDEP, and the Town of Bedford Board of Health. Annual reports will identify all implementation actions that have been taken and need to be taken to maintain institutional controls according to the ROD, including inconsistent land use activity at the site, any institutional controls failures, and the corrective action taken or proposed for each. If the property has been transferred, then the annual evaluation will address whether the institutional controls were communicated in the deed(s); whether the owners and state and local agencies were notified of the institutional controls affecting the property; and whether use of the property has conformed to such institutional controls.
- Address any activity that is inconsistent with the institutional control objectives or use restrictions, or any other action that may interfere with the effectiveness of the institutional controls, as soon as practicable, but in no case will the process be initiated later than 10 days after the Navy becomes aware of the breach. The Navy will notify EPA and MassDEP as soon as practicable but no later than 10 days after discovery of any activity that is inconsistent with the institutional control objectives or use restrictions, or any other action that may interfere with the effectiveness of the institutional controls. The Navy will notify EPA and MassDEP regarding how the Navy has addressed or will address the breach within 10 days of sending EPA and MassDEP notification of the breach.
- Notify EPA and MassDEP at least 45 days in advance of: proposals for changes in land use that would be inconsistent with use restrictions and exposure assumptions described in this ROD; any anticipated action that may disrupt institutional controls effectiveness; or, any action that may alter or negate the need for institutional controls. In the event of property transfer, prior to seeking approval from the EPA and MassDEP, the recipient of the property must notify and obtain approval from the Navy of any proposals for a land use change at the site inconsistent with the use restrictions and assumptions described in the ROD.
- Notify EPA and MassDEP at least 6 months prior to any transfer or sale of property so that EPA and MassDEP can be involved in discussions to ensure that appropriate provisions are included in the transfer terms or conveyance documents to maintain effective institutional controls. If it is not possible to notify EPA and MassDEP at least 6 months prior to any transfer or sale, then the Navy will notify EPA and MassDEP as soon as possible but no later than 60 days prior to the transfer or sale of any property subject to institutional controls. In addition to the land transfer notice and discussion provisions above, the Navy further agrees to provide EPA and MassDEP with similar notice, within the same time frames, as to federal-to-federal transfer of property. The Navy shall provide a copy of executed deed or transfer assembly to EPA and MassDEP.

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- Obtain EPA and MassDEP concurrence prior to modifying or terminating institutional controls objectives, the property extent of institutional controls, or required institutional controls implementation actions.

Following the execution of the ROD, the Navy, with concurrence of EPA and in consultation with MassDEP, will develop the institutional control implementation and maintenance plan (the Institutional Control Remedial Design), which will include the above-listed requirements. The Navy will be responsible for implementing, inspecting, maintaining, reporting, and enforcing the institutional controls described in the ROD in accordance with the approved Institutional Control Remedial Design. Should any institutional control component of the selected remedy fail, the Navy will ensure that appropriate actions are taken to reestablish the selected remedy's protectiveness. The Navy may transfer various operational responsibilities for these actions to other parties through contracts, agreements, and/or deed restrictions; however, the Navy acknowledges its ultimate responsibility under CERCLA for remedy integrity, including for the performance of any transferred operational responsibilities.

#### **Five-Year Site Reviews**

This alternative would include five-year reviews by the Navy, in conjunction with EPA and MassDEP, until site conditions are suitable for unlimited use and unrestricted exposure. These reviews will be conducted in accordance with the FFA for NWIRP Bedford and will include a record review (e.g., monitoring data, institutional controls annual reports, reuse plans) and a visual inspection to confirm that the alternative was implemented and achieves the established objectives.

If during a five-year review it is determined that groundwater contaminant levels are not attenuating at an acceptable rate to be protective of human health and the environment, then the Navy will evaluate the installation of source area extraction wells to capture contaminants and prevent their migration from the source area. If selected, the system design would be developed at that time. Extracted groundwater would be treated using the existing Site 3 groundwater treatment system which is designed to remove VOCs by activated carbon filtration. The Site 3 system, which currently operates at a rate of approximately 10 gallons per minute (gpm), can accommodate the extra flow from Site 4 as it is designed to operate at a total capacity of 25 to 30 gpm. Due to the co-mingling of the Site 4 and Site 3 plumes, groundwater extraction at Site 4 also would act to remove contaminants from a portion of the Site 3 plume. Further monitoring would be conducted to evaluate when COC concentrations have sufficiently reduced so that the extraction wells could be decommissioned (e.g., when remediation goals have been achieved or when COC concentrations have been sufficiently reduced to allow for successful natural attenuation).

#### **C. Summary of the Estimated Remedy Costs**

Tables 12 and 13 present a summary table of the major capital and annual O&M costs associated with implementing excavation and MNA at Site 4. The estimated total present worth of the selected remedy is \$1,376,000. The information provided in these cost summary tables has been updated from the 2001 FS and were presented in the 2008 FS addendum. Costs for excavation are based on a conservative (pre-removal action) estimate of the affected soil in the source area. Changes in the cost estimate are anticipated based on the results of the pre-design investigation and the remedial design.

#### **D. Expected Outcomes of the Selected Remedy**

The primary expected outcome of the selected remedy is that Site 4 COCs in groundwater will no longer present an unacceptable risk to humans via the hypothetical use of groundwater as a drinking water source. Following removal of residual COCs in source area soils, approximately 5 to 10 years are estimated to be needed to achieve the goals across the Site, which would make use of groundwater at the Site consistent with its GUVd.

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Groundwater cleanup levels were established for all COCs identified in the HHRA that were found to pose an unacceptable risk to public health. No unacceptable environmental risks were identified in the ERA. Cleanup levels were set based on the chemical-specific ARARs for these COCs (e.g., federal MCLs, non-zero MCLGs, and more stringent State MCLs) as available, or based on risk-based calculations.

The aquifer at Site 4 is considered a potential source of drinking water, based on the completion of a GUVI by the MassDEP (Appendix G). This finding indicates that the groundwater beneath the Site has high value as a future drinking water supply, and therefore drinking water standards, consistent with the use and value determination, shall be attained in the groundwater at the Site. Groundwater cleanup goals are presented in Table 8. Upon achieving cleanup goals, the Site would be suitable for unlimited use and unrestricted exposure.

## **XII. STATUTORY DETERMINATIONS**

The selected remedy for implementation at Site 4 is consistent with CERCLA and, to the extent practicable, the NCP, as discussed below.

- **Protection of Human Health and the Environment** – The selected remedy will be protective of human health and the environment through the reduction of COC concentrations in Site groundwater to achieve regulatory- and risk-based PRGs. Based on the ERA, current conditions do not pose unacceptable risk to ecological receptors. The HHRA identified unacceptable risks associated with the use of groundwater as a drinking water source. The available monitoring data and MNA evaluations indicate that natural attenuation is reducing COC concentrations but that additional remediation is warranted in the source area to mitigate residual contamination that continues to act as a source for elevated groundwater COC concentrations. Additional excavation of the source area will allow natural attenuation processes in groundwater to achieve remediation goals in a shorter timeframe. Institutional controls will be implemented to prevent exposure to Site COCs during the interim time to complete remediation. By reducing COC concentrations below PRGs, it is expected that the potential human health risk levels will not exceed EPA's acceptable risk range of  $10^{-4}$  to  $10^{-6}$  for incremental carcinogenic risk and the non-carcinogenic hazard will be below a HI level of 1.
- **Compliance with ARARs** – The selected remedy will comply with all federal and state ARARs that pertain to the Site. In addition, to-be-considered guidance documents ("TBCs") will also be considered during the implementation of the remedial action. ARARs and TBCs for the selected remedy are presented in Appendix F.
- **Cost-Effectiveness** – The selected remedy is cost-effective as its costs are proportional to its overall effectiveness by achieving long-term effectiveness and permanence within a reasonable timeframe. MNA can achieve remedial goals at a low cost. Additional excavation within the source area will expedite natural attenuation processes by reducing the source of COCs to groundwater.
- **Utilization of Permanent Solutions and Alternative Treatment or Resource Recovery Technologies to the Maximum Extent Practicable** – The selected remedy includes treatment and permanent solutions to the maximum extent practicable to achieve remedial goals. The Navy has already completed two source area removal actions (ISCO and in-situ thermal treatment). Additional excavation will further reduce the source of dissolved-phase COCs to groundwater. Excavated soil may be treated to the extent practicable onsite using ex-situ biopiles. The treated soil may be used as backfill for the excavated area.
- **Preference for Treatment Which Permanently and Significantly Reduces the Toxicity, Mobility or Volume of the Hazardous Substances as a Principal Element** – The selected remedy may include ex-situ biological treatment (biopiles) for soil excavated from the source area, treatment of COCs in excavation water (if encountered), and the potential addition of an oxygen-releasing compound into the excavation to augment biodegradation of groundwater COCs (enhanced

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bioremediation). Thus, the statutory preference for treatment as a principal element is partially satisfied for the residual COCs. The Navy's previously completed in-situ source area treatments (ISCO and thermal treatment) satisfied the preference for treatment.

- **Five-Year Review Requirements** – The Navy, in conjunction with EPA and MassDEP, will conduct a review within five years after initiation of the remedial action to ensure that the remedy continues to provide adequate protection of human health and the environment. Five-year reviews will be continued until Site conditions are remediated to levels that allow for unlimited use and unrestricted exposure.

### **XIII. DOCUMENTATION OF SIGNIFICANT CHANGES**

In May 2002, the Navy issued a Proposed Plan for public review recommending ISCO for source area soil and groundwater, followed by MNA for the remaining Site area. Since that time, the Navy completed the ISCO removal action as well as a follow-up removal action in 2003 using in-situ thermal treatment of the source area. Based on the results of the monitoring program since those two source removals, it appears that source area concentrations have slightly rebounded and are remaining stable. Therefore, the Navy determined that additional source area remediation was warranted to augment the MNA of the residual groundwater plume. As a result of this new information, the Navy issued an updated Proposed Plan in 2009 which specified excavation and MNA as the new preferred remedial alternative. The second Plan was made available to the public in June 2009. The comments received during the second public comment period required no changes to the proposed remedy.

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**TABLE 1A**  
**SUMMARY OF MAXIMUM COC CONCENTRATIONS**  
**IN ENVIRONMENTAL MEDIA AT SITE 4 PRIOR TO REMOVAL ACTIONS**

Chemical of Potential Concern	Groundwater Data		Soil Data		Sediment Data		Surface Water Data	
	Max Site Conc (µg/L)	Location	Max Site Conc (µg/kg)	Location	Max Site Conc (µg/kg)	Location	Max Site Conc (µg/L)	Location
Benzene	3,200	MW-18	150	IW-24	4	SED12-5	ND	--
Toluene	49,000	MW-18	59,000	IW-24	11	SED12-4	ND	--
Ethylbenzene	7,800	MW-18	46,000	IW-24	ND	--	ND	--
Xylenes (Total)	40,000	MW-18	350,000	IW-24	ND	--	ND	--
2-Methylnaphthalene	1,300	MW-18	3,700	MW-15S	ND	--	ND	--
Naphthalene	2,500	MW-18	14,000	IW-24	ND	--	ND	--
<b>Notes:</b> Data are expressed in parts per billion. ND: Not Detected NA: Not Analyzed								

**TABLE 1B**  
**SUMMARY OF MAXIMUM COC CONCENTRATIONS**  
**IN GROUNDWATER AT SITE 4 (MARCH 2009)**

Chemical of Concern	Groundwater Data	
	Max Site Conc (µg/L)	Location
Benzene	12	MW-18SR
Toluene	22	MW-18SR
Ethylbenzene	530	MW-18SR
Xylenes (Total)	720	MW-18SR
2-Methylnaphthalene	43.4	MW-18SR (a)
Naphthalene	190	MW-18SR
<b>Notes:</b> Data are expressed in parts per billion. (a) Most recent data for 2-methylnaphthalene are from the December 2005 sampling event.		

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**TABLE 2**  
**SUMMARY OF CHEMICALS OF POTENTIAL CONCERN**  
**USED IN HUMAN HEALTH RISK ASSESSMENT**

Exposure Point <sup>(3)</sup>	Chemicals of Potential Concern	Conc. Detected Min	Conc. Detected Max	Units	Frequency of Detection	Exposure Point Conc.	Units	Statistical Measure
Soil								
Surface Soil	Arsenic	4.3	8.1	ppm	11/11	6.51	ppm	95% UCL
	Beryllium	0.34	0.58	ppm	11/11	0.48	ppm	95% UCL
	Silver	1.3	119	ppm	3/8	44.43	ppm	95% UCL
	Total B(a)P-TE	64.8	856.9	ppb	11/11	471.27	ppb	95% UCL
	Total cPAH	516	4,730	ppb	9/11	2,777.68	ppb	95% UCL
Subsurface Soil	Beryllium	0.20	0.84	ppm	19/19	0.54	ppm	95% UCL
	Total B(a)P-TE	404.4	2,753.3	ppb	18/18	844.19	ppb	95% UCL
	Total cPAH	2,013	21,920	ppb	6/18	5,412.55	ppb	95% UCL
Groundwater								
Private Wells	Aluminum	207	76,000	ppb	37/37	76,000	ppb	Max
& Hartwell	Arsenic	1.6	114	ppb	21/37	114	ppb	Max
Road	Beryllium	1.0	3.6	ppb	6/37	3.6	ppb	Max
Municipal	Cadmium	2.35	11.2	ppb	8/37	11.2	ppb	Max
Wells	Lead	1.6	50.6	ppb	22/36	50.6	ppb	Max
(measured)	Manganese	31.9	6,590	ppb	37/37	6,590	ppb	Max
	Nickel	13.8	131	ppb	22/37	131	ppb	Max
	Vanadium	6.3	222	ppb	22/37	222	ppb	Max
	4-Chloroaniline	7.5	7.5	ppb	1/36	7.5	ppb	Max
	2-Methylnaphthalene	8.0	1,300	ppb	3/37	1,300	ppb	Max
	Naphthalene	1.5	2,500	ppb	5/37	2,500	ppb	Max
Private Wells	1,1-Dichloroethane	-	-	-	-	2.71	ppb	Peak
(modeled)	1,2-Dichloroethane	-	-	-	-	2.38	ppb	Peak
	1,1-Dichloroethylene	-	-	-	-	5.11	ppb	Peak
	1,2-Dichloroethene (total)	-	-	-	-	2.41	ppb	Peak
	Trichloroethylene	-	-	-	-	4.30	ppb	Peak
Hartwell Road	Benzene	-	-	-	-	0.1	ppb	Peak
Municipal	1,1-Dichloroethane	-	-	-	-	1.14	ppb	Peak
Wells	1,2-Dichloroethane	-	-	-	-	2.11	ppb	Peak
(modeled)	1,1-Dichloroethylene	-	-	-	-	0.46	ppb	Peak
	1,2-Dichloroethene (total)	-	-	-	-	14.1	ppb	Peak
	Tetrachloroethylene	-	-	-	-	0.06	ppb	Peak
	1,1,1-Trichloroethane	-	-	-	-	0.05	ppb	Peak
	Trichloroethylene	-	-	-	-	3.0	ppb	Peak
On-site	2-Butanone (MEK)	5.0 <sup>(1)</sup>	470 <sup>(1)</sup>	ppb	-	470	ppb	Max <sup>(2)</sup>
	2-Methylnaphthalene	8.0 <sup>(1)</sup>	1,300 <sup>(1)</sup>	ppb	-	1,300	ppb	Max <sup>(2)</sup>
	Acetone	7.0 <sup>(1)</sup>	510 <sup>(1)</sup>	ppb	-	510	ppb	Max <sup>(2)</sup>
	Benzene	1.0 <sup>(1)</sup>	2,090 <sup>(1)</sup>	ppb	-	2,090	ppb	Max <sup>(2)</sup>
	Ethylbenzene	2.0 <sup>(1)</sup>	3,497 <sup>(1)</sup>	ppb	-	3,497	ppb	Max <sup>(2)</sup>
	Methyl-tert-Butyl Ether	1.0 <sup>(1)</sup>	37 <sup>(1)</sup>	ppb	-	37	ppb	Max <sup>(2)</sup>
	Naphthalene	79.0 <sup>(1)</sup>	600 <sup>(1)</sup>	ppb	-	600	ppb	Max <sup>(2)</sup>
	Toluene	4.0 <sup>(1)</sup>	22,367 <sup>(1)</sup>	ppb	-	22,367	ppb	Max <sup>(2)</sup>
	Xylene (Total)	5.0 <sup>(1)</sup>	18,533 <sup>(1)</sup>	ppb	-	18,533	ppb	Max <sup>(2)</sup>

**Notes:**

Highlighted rows indicate the specific Site 4 COCs.

(1) Notes: Average concentration by monitoring wells from May 1998 to June 2000 were used. One-half the detection limit was used for non-detect values except where the compound was never detected in a specific well.

(2) The EPCs represent the highest average concentration among all wells.

(3) The vapor intrusion pathway was qualitatively assessed in the 2001 HHRA Addendum.

B(a)P-TE: Benzo(a)pyrene toxic equivalents

cPAH: Carcinogenic polycyclic aromatic hydrocarbons

ppm: parts per million (mg/kg or mg/L)

ppb: parts per billion (µg/kg or µg/L)

95% UCL: 95% Upper Confidence Limit

Max: Maximum concentration

Peak: Modeled concentrations under the most severe pumping conditions

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**TABLE 3**  
**POTENTIAL CARCINOGENIC TOXICITY DATA SUMMARY**  
**FROM HUMAN HEALTH RISK ASSESSMENT**

Chemical of Potential Concern	Oral Cancer Slope Factor (mg/kg)/day	Reference (Last Verified)	Weight of Evidence/ Cancer Guideline Description
Acetone	NA	IRIS (6/2001)	D
Aluminum	ND	NA	ND
Arsenic	1.50E+00	IRIS (2/96)	A
Beryllium	4.30E+00	IRIS (2/96)	B2
Lead	ND	NA	B2
Manganese	ND	NA	D
Silver	ND	NA	D
2-Butanone	NA	IRIS (6/01)	D
2-methylnaphthalene	NA	IRIS (6/01)	NA
Methyl tert-Butyl Ether	NA	IRIS (6/01)	NA
Naphthalene	ND	IRIS (2/96)	D
		IRIS (6/01)	C
Total B(A)P-TE	7.30E+00	IRIS (2/96)	B2
Total cPAH	ND	NA	D
Benzene	2.90E-02	IRIS (2/96)	A
	5.50E-02	IRIS (6/01)	
1,1,1-Trichloroethane	ND	NA	D
1,1-Dichloroethane	ND	NA	C
1,2-Dichloroethane	9.10E-02	IRIS (2/96)	B2
1,1-Dichloroethene	6.00E-01	IRIS (2/96)	C
1,2-Dichloroethene	ND	NA	ND
(total)			
Ethylbenzene	NA	IRIS (6/01)	D
Tetrachloroethene	5.20E-02	SHRTSC (10/93)	B2
Trichloroethene	1.10E-02	SHRTSC (10/93)	B2
Toluene	NA	IRIS (6/01)	D
Xylene	NA	IRIS (6/01)	D
Notes:			
Highlighted rows indicate the specific Site 4 COCs.			
mg/kg: milligram per kilogram (mg/kg or mg/L)			
cPAH: Carcinogenic polycyclic aromatic hydrocarbons			
B(a)P-TE: Benzo(a)pyrene toxic equivalents			
NA: Not available			
ND: Not determined			
IRIS: Integrated Risk Information System, an online computer database of toxicological information (EPA, 1996)			
SHRTSC: U.S. EPA Superfund Health Risk Technical Support Center			
A: Human carcinogen			
B2: Probable human carcinogen – Indicates sufficient evidence in animals or no evidence in humans			
C: Possible human carcinogen			
D: Not classifiable as a human carcinogen			

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**TABLE 4**  
**POTENTIAL NON-CARCINOGENIC TOXICITY DATA SUMMARY**  
**FROM HUMAN HEALTH RISK ASSESSMENT**

Chemical of Potential Concern	Oral Dose-Response Value (mg/kg-day)	Target Organ/ Critical Effect at LOAEL	EPA Confidence Level	Reference (Last Verified)
Acetone	1.00E-01	Increased liver & kidney weights, nephrotoxicity	Low	IRIS (6/01)
Aluminum	ND	NA	NA	NA
Arsenic	3.00E-04	Hyperpigmentation, keratosis; vascular complications	Medium	IRIS (2/96)
Beryllium	5.00E-03	No adverse effects observed	Low	IRIS (2/96)
Lead	NA	NA	NA	NA
Manganese	4.70E-02 (a)	CNS effects	Medium	IRIS (2/96)
Manganese	1.40E-01 (b)	CNS Effects	Medium	IRIS (2/96)
Silver	5.00E-03	Argyria	Low	IRIS (2/96)
2-Butanone	6.00E-01	Decreased fetal birth weight	Low	IRIS (6/01)
2-methylnaphthalene	2.00E-02	NA	NA	NCEA (1995)
Naphthalene	4.00E-02	Decreased body weight	NA	NCEA (1995)
	2.00E-02	Decreased mean terminal body weight	Low	IRIS (6/01)
Total B(a)P-TE	NA	NA	NA	NA
Total cPAH	3.00E-02 (c)	Kidney effects	Low	IRIS (2/96)
Benzene (d)	3.00E-04	Blood effects	Medium	NCEA (1995)
	3.00E-03	NA	NA	NCEA <sup>(1)</sup>
1,1,1-Trichloroethane	2.00E-02	CNS effects	Medium-Low	NCEA (1996)
1,1-Dichloroethane	1.00E-01	No adverse effects observed	NA	HEAST (1995)
1,2-Dichloroethane	3.00E-02	Changes in organ weights	Low	NCEA (1993)
1,1-Dichloroethene	9.00E-03	Hepatic lesions	Medium	IRIS (2/96)
1,2-Dichloroethene (total)	9.00E-03	Hepatic lesions	ND	HEAST (1995)
Ethylbenzene	1.00E-01	Liver and kidney toxicity	Low	IRIS (2/96)
Tetrachloroethene	1.00E-02	Liver toxicity	Medium	IRIS (2/96)
Trichloroethene	6.00E-03	Liver toxicity	Low	NCEA (1996)
Toluene	2.00E-01	Changes in liver and kidney weights	Medium	IRIS (2/96 & 6/01)
Xylenes	2.00E+00	Hyperactivity; decreased body weight; increased mortality	Medium	IRIS (2/96 & 6/01)

Notes:  
Highlighted rows indicate the specific Site 4 COCs.  
mg/kg: milligram per kilogram  
CNS: Central nervous system  
cPAH: Carcinogenic polycyclic aromatic hydrocarbons  
B(a)P-TE: Benzo(a)pyrene toxic equivalents  
ND: Not determined  
NA: Not available

HEAST: Health Effects Assessment Summary Tables, published annually by the U.S. EPA (1995)  
IRIS: Integrated Risk Information System, an online computer database of toxicological information (EPA, 2000)  
LOAEL: Lowest observed adverse effects level  
NCEA: National Center for Environmental Assessment

(1): As reported in EPA Region 3 Risk-Based Concentrations Table, May 8, 2001  
(a): Used for all exposures except dietary  
(b): Used for dietary exposure only  
(c): Due to structural similarities, the dose response value for pyrene is assigned to this compound  
(d): First values shown were those used in the Phase II RI (TtNUS, 2000b); second values shown were those used in the Addendum to the Site 4 FS (TtNUS, 2001b)

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**TABLE 5**  
**SUMMARY OF HUMAN HEALTH RISK ASSESSMENT**

Scenario Evaluated <sup>(3)</sup>	Media	Total Carcinogenic Risk <sup>(1)</sup> (statistical chance)	Total Non-Carcinogenic Risk <sup>(2)</sup> (Hazard Index)
Current & Future Site Worker			
Ingestion/Inhalation/ Dermal Contact	Surface Soil	1.31E-06	8.06E-03
<b>Current &amp; Future Site Worker Total</b>		<b>1.3E-06</b>	<b>8.1E-03</b>
Current Trespassing Teenager			
Ingestion/Inhalation/ Dermal Contact	Surface Soil	5.96E-07	1.83E-02
<b>Current Trespassing Teenager Total</b>		<b>1.4E-06</b>	<b>5.1E-02</b>
Future Construction Worker			
Ingestion/Inhalation/ Dermal Contact	Surface Soil	9.74E-08	1.50E-02
	Subsurface Soil	4.52E-08	1.13E-04
<b>Future Construction Worker Total</b>		<b>1.4E-07</b>	<b>1.5E-02</b>
Future Trespassing Teenager			
Ingestion/Inhalation/ Dermal Contact	Surface Soil	5.96E-07	1.83E-02
	Groundwater (private wells)	2.77E-05	1.49E+00
<b>Future Trespassing Teenager Total</b>		<b>2.91E-05</b>	<b>1.54E+00</b>
Ingestion/Inhalation/ Dermal Contact	Surface Soil	5.96E-07	1.83E-02
	Groundwater (municipal wells)	2.33E-05	1.50E+00
<b>Future Trespassing Teenager Total</b>		<b>2.47E-05</b>	<b>1.56E+00</b>
Future Off-site Resident			
Ingestion/Dermal Contact	Groundwater from private wells (Total)	2.09E-04	1.87E+00
	Groundwater from municipal wells (Total)	1.75E-04	1.89E+00
<b>Future Off-site Resident Total</b>		<b>3.84E-04</b>	<b>3.76E+00</b>
Future On-Site Resident			
Ingestion/Inhalation/ Dermal Contact	Groundwater from Site 4	2.70E-03	4.97E+01
<b>Future On-Site Resident Total</b>		<b>2.70E-03</b>	<b>4.97E+01</b>
Notes:			
(1) Benzene (2.70 x 10 <sup>-3</sup> ) is the only contributor to this cancer risk estimate.			
(2) 2-methylnaphthalene(1.78), benzene (38.2), ethylbenzene (1.92), and toluene (6.13) were the main contributors to this Non-cancer risk estimate.			
(3) Future on-site residential exposure to soil was not evaluated in the HHRA. The vapor intrusion pathway was qualitatively assessed in the 2001 HHRA Addendum.			

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**TABLE 6**  
**SUMMARY OF CHEMICALS OF POTENTIAL CONCERN**  
**USED IN THE ECOLOGICAL RISK ASSESSMENT**

Exposure Medium	Chemical of Potential Concern	Frequency of Detection	Minimum Conc.	Maximum Conc.	Units	Maximum Exposure Point Conc.	Units	Statistical Measure
<b>Riparian Forest Areas</b>								
Runoff/ Seepage	Aluminum	3/4/4	299	2,480	ppb	2,135	ppb	95% UCL
	Cadmium	2/4/4	6.3	19.1	ppb	17	ppb	95% UCL
	Copper	4/4/4	12.1	55.2	ppb	55	ppb	95% UCL
	Iron	4/4/4	174	2,980	ppb	2,980	ppb	Maximum
	Lead	3/4/4	8.2	51.9	ppb	45	ppb	95% UCL
	Zinc	4/4/4	42.5	176	ppb	164	ppb	95% UCL
Wetland Sediment	Aluminum	6/6/6	6,765	14,050	ppm	10,941	ppm	95% UCL
	Arsenic	6/6/6	4.2	38.6	ppm	37	ppm	95% UCL
	Cadmium	4/5/5	1.9	8.7	ppm	7.2	ppm	95% UCL
	Calcium	6/6/6	712	5,050	ppm	4,033	ppm	95% UCL
	Copper	6/6/6	14.3	44.2	ppm	33	ppm	95% UCL
	Iron	6/6/6	9,120	54,700	ppm	35,193	ppm	95% UCL
	Lead	6/6/6	19.3	121.1	ppm	82	ppm	95% UCL
	Selenium	4/6/6	2.5	5.2	ppm	4.4	ppm	95% UCL
	Silver	1/2/2	3.9	3.9	ppm	3.9	ppm	Maximum
	Total PAHs	5/5/5	135	23,783	ppm	16.2	ppm	95% UCL
Surface Soil	Arsenic	24/24/24	2.9	42.1	ppm	10.04	ppm	95%UCL
	Silver	4/17/17	0.91	119	ppm	20.20	ppm	95% UCL
	Alpha Chlordane	1/1/1	0.0025	0.0025	ppm	0.0025	ppm	Maximum
	Bis(2-ethylhexyl)phthalate	5/24/24	0.07	12	ppm	1.636	ppm	95% UCL
	Total PAHs	24/24/24	1.51	25.1	ppm	7.35	ppm	95% UCL
	1,2-dichloroethene (total)	5/24/24	0.002	0.032	ppm	0.009	ppm	95% UCL
	Tetrachloroethene	4/24/24	0.001	0.036	ppm	0.009	ppm	95% UCL
	Trichloroethene	8/24/24	0.002	0.055	ppm	0.013	ppm	95% UCL
<b>Elm Brook</b>								
Surface Water	Iron	3/3/3	247	2,830	ppb	2,830	ppb	Maximum
Sediment	Aluminum	6/6/6	2,790	5,930	ppm	4,587	ppm	95%UCL
	Arsenic	6/6/6	3.9	47.4	ppm	36	ppm	95% UCL
	Total PAHs	6/6/6	1.62	17.34	ppm	12.29	ppm	95% UCL
	1,2-dichloroethene (total)	1/6/6	0.21	0.21	ppb	0.11	ppb	95% UCL
Groundwater Discharge	Aluminum	4/4/4	1,810	9,030	ppb	8,670	ppb	95% UCL
	Chromium	3/4/4	33.6	97	ppb	93	ppb	95% UCL
	Copper	2/4/4	61.3	85.4	ppb	85	ppb	Maximum
	Iron	4/4/4	4,130	25,300	ppb	25,238	ppb	95% UCL
	Lead	3/4/4	16.9	48.6	ppb	46	ppb	95% UCL
	Zinc	3/4/4	18.7	213	ppb	183	ppb	95% UCL
Notes: ppm: parts per million (mg/kg or mg/L) ppb: parts per billion (µg/kg or µg/L) 95% UCL: 95% Upper Confidence Limit PAHs: Polycyclic aromatic hydrocarbons Frequency of Detection: Number of detects/ number used to calculate statistics/ number of sampling points								

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**TABLE 7  
SUMMARY OF POTENTIAL EXPOSURE PATHWAYS USED IN THE ECOLOGICAL RISK ASSESSMENT**

Exposure Medium	Potential Receptor	Sensitive Environment (Y/N)	Sensitive Species (Y/N)	Exposure Routes Evaluated	Assessment Endpoints	Measurement Endpoints	Findings
<b>Riparian Forest</b>							
Surface Soil	- Terrestrial Wildlife - Terrestrial Plants	No	No	- Ingestion - Dermal Absorption - Plant Uptake	Protection and maintenance of upland terrestrial biota and habitats.	- Comparison to soil benchmark values - Modeling & evaluation of potential adverse effects - Qualitative evaluation (field walkovers, habitat characterization, and observation)	Minimal potential for ecological risks
Wetland Sediments	- Terrestrial Wildlife - Terrestrial Plants - Aquatic Life	No	No	- Ingestion - Dermal Absorption - Plant Uptake	Protection and maintenance of the riparian forested wetland biota and habitats	- Comparison of wetland concentrations to water quality criteria or benchmark values - Modeling and evaluation of potential adverse effects - Qualitative evaluation (through field walkovers, habitat characterization, and observation)	Minimal potential for ecological risks
Runoff/ Seepage	- Aquatic Life - Terrestrial Wildlife	No	No	- Ingestion, dermal absorption & respiration for aquatic life - Ingestion & dermal absorption for terrestrial wildlife	Protection and maintenance of upland terrestrial and wetland biota and habitats.	- Comparison of wetland concentrations to water quality criteria or benchmark values - Modeling and evaluation of potential adverse effects - Qualitative evaluation (field walkovers, habitat characterization, and observation)	Minimal potential for ecological risks
<b>Elm Brook</b>							
Sediment	- Terrestrial Wildlife - Wetland Plants - Aquatic Life	No	No	- Ingestion - Dermal Absorption - Plant Uptake	Protection and maintenance of Elm Brook biota and habitats.	- Comparison of sediment concentrations to water quality criteria or benchmark values - Modeling of potential adverse effects - Qualitative evaluation of upland conditions through field walkovers, habitat characterization, and observation - Evaluation of macroinvertebrate study	Minimal potential for ecological risks
Surface Water	- Aquatic Life - Terrestrial Wildlife	No	No	- Ingestion, dermal absorption & respiration/ immersion for aquatic life - Ingestion & dermal absorption for terrestrial wildlife	Protection and maintenance of Elm Brook biota and habitats.	- Comparison of surface water concentrations to water quality criteria or benchmark values - Modeling of potential adverse effects - Qualitative evaluation of upland conditions through field walkovers, habitat characterization, and observation - Evaluation of macroinvertebrate study	Minimal potential for ecological risks
Groundwater Discharge	- Aquatic Life	No	No	- Ingestion - Dermal Absorption - Respiration	Protection and maintenance of Elm Brook biota and habitats.	- Comparison of wetland concentrations to water quality criteria or benchmark values - Modeling of potential adverse effects - Qualitative evaluation of upland conditions through field walkovers, habitat characterization, and observation - Evaluation of macroinvertebrate study	Minimal potential for ecological risks

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**TABLE 8**  
**CHEMICALS OF CONCERN AND CLEANUP GOALS (µg/L) FOR GROUNDWATER AT SITE 4**

Chemical of Concern	Federal MCL (a)	Federal non-zero MCLG (a)	State MCL (b)	Site-Specific Risk-based Cleanup Goal (c)	Cleanup Goal for Site 4 (d)
Benzene	5	-- (e)	5	--	5
Ethylbenzene (f)	700	700	700	--	700
Toluene	1,000	1,000	1,000	--	1,000
Xylenes	10,000	10,000	10,000	--	-- (g)
2-methylnaphthalene	--	--	--	150 (c)	150
Naphthalene	--	--	140 (h)	--	-- (g)

Notes:  
units shown in µg/L (micrograms per liter) or parts per billion  
"--" indicates standard not available, or site-specific risk-based cleanup goal not calculated

MCL: Maximum contaminant level  
MCLG: Maximum contaminant level goal

(a) EPA Drinking Water Standards and Health Advisories, October 1996  
(b) Drinking Water Standards and Guidelines for Chemicals in Massachusetts Drinking Waters, MassDEP Office of Research and Standards, Spring 2009.  
(c) The 2001 HHRA Addendum calculated a risk-based concentration of 730 µg/L for 2-methylnaphthalene based on the oral reference dose (RfD) of that time (2E-02 mg/kg/day). The updated RfD (4E-03 mg/kg/day), as reported in the September 2008 Regional Screening Tables, was used to calculate the current risk-based concentration of 150 µg/L.  
(d) Cleanup goal is the lowest value recorded.  
(e) The MCLG for benzene is "zero," however, only non-zero MCLGs are considered  
(f) The EPA tap-water RSL for ethylbenzene is 1.5 µg/L.  
(g) Xylenes and naphthalene were not identified as COCs during the risk assessment; therefore, no cleanup goals are provided. However, xylenes and naphthalene are associated with the Site 4 release and will be evaluated during the monitoring program.  
(h) Non-MCL drinking water guidance value.

**TABLE 9**  
**TARGET BENCHMARKS (mg/kg) FOR SOURCE AREA SOIL EXCAVATION AT SITE 4**

Soil Constituent	Soil 0-3 ft bgs (mg/Kg)	Basis (MCP Method 1)	Soil 3-15 ft bgs (mg/Kg)	Basis (MCP Method 1)	Soil >15 ft bgs (mg/Kg)	Basis (MCP Method 1)
Benzene	2	S-1/GW-1	2	S-2/GW-1	2	S-3/GW-1
Toluene	30	S-1/GW-1	30	S-2/GW-1	30	S-3/GW-1
Ethylbenzene	40	S-1/GW-1	40	S-2/GW-1	40	S-3/GW-1
Xylenes	400	S-1/GW-1	400	S-2/GW-1	400	S-3/GW-1
2-Methylnaphthalene	0.7	S-1/GW-1	0.7	S-2/GW-1	0.7	S-3/GW-1
Naphthalene	4	S-1/GW-1	4	S-2/GW-1	4	S-3/GW-1

Notes:  
mg/Kg = milligram of contaminant per kilogram of soil

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**TABLE 10**  
**SUMMARY OF SOURCE CONTROL AND MIGRATION MANAGEMENT ALTERNATIVES**

Alternative	Components	Details	Cost
<b>Source Control</b>			
<b>No Further Action (SC-1)</b> <i>No further action for contaminated groundwater with no restriction on activities</i>	-Five-Year Reviews	-No action	Capital Cost: \$0  Total O&M Cost: Nominal  Present-Worth Cost: Nominal  Timeframe: N/A
<b>Pump-and-Treat (SC-2)</b> <i>Groundwater management involving extraction, treatment, and discharge</i>	-Groundwater Extraction  -Groundwater Treatment  -Groundwater Management  -Monitoring  -Institutional Controls  -Five-Year Reviews	-Extraction of groundwater from five wells at a rate of 0.6 gpm using pneumatic-bladder pumps or a jet pump system  -Treatment of groundwater using the Site 3 IRA groundwater treatment system which includes oxidation, chemical addition, settling, sludge filtering, two stages of physical filtration, and GAC adsorption  -Treated groundwater discharged to the side of Hartwells Hill  -Installation of five new monitoring wells  -Sampling and analysis of groundwater and recording of groundwater elevations to determine the capture zone and evaluate efficiency  -Monitoring of extraction and treatment system to evaluate extraction effectiveness  -On- and off-property institutional controls to restrict the use of groundwater so that the potential exposure pathway to contamination would remain incomplete until performance standards have been achieved. On-property institutional controls to restrict residential redevelopment and occupancy of site structures until a supplemental risk assessment is conducted showing no unacceptable risk.	Capital Cost: \$413,000  Total O&M Cost: \$3,103,000  Present-Worth Cost: \$3,516,000  Timeframe: 25 years

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Alternative	Components	Details	Cost
<b>In-situ Chemical Oxidation (SC-3)</b> <i>Injection of chemical oxidants to convert contaminants into naturally occurring compounds</i>	<ul style="list-style-type: none"> <li>-Site Preparation and Mobilization</li> <li>-Injector Well and Monitoring Well Installation</li> <li>-Performance and Process Monitoring</li> <li>-Treatment</li> <li>-Institutional Controls</li> </ul>	<ul style="list-style-type: none"> <li>-Preparation of a mobile treatment unit</li> <li>-Installation of 10 injection wells and 9 additional monitoring wells</li> <li>-Pre- and post-application analyses of groundwater samples from 13 wells to evaluate the overall effectiveness of the treatment technology</li> <li>-Process monitoring during technology application to assess geochemical conditions and monitor the reaction progress</li> <li>-Injection of reagents into the subsurface with a second or third phase of treatment if necessary</li> <li>-On- and off-property institutional controls to restrict the use of groundwater so that the potential exposure pathway to contamination would remain incomplete until performance standards have been achieved. On-property institutional controls to restrict residential redevelopment and occupancy of site structures until a supplemental risk assessment is conducted showing no unacceptable risk.</li> </ul>	<ul style="list-style-type: none"> <li>Capital Cost: \$575,000</li> <li>Total O&amp;M Cost: \$0</li> <li>Present-Worth Cost: \$575,000</li> <li>Timeframe: 1 year</li> </ul>
<b>In-situ Thermal Treatment (SC-4)</b> <i>Removal and destruction of organic contamination using ERH and thermal conductivity heating</i>	<ul style="list-style-type: none"> <li>-Site Preparation and Mobilization</li> <li>-Install Electrodes/Vent Wells/Monitoring Wells/Extraction Wells</li> <li>-Performance and Process Monitoring</li> <li>-Treatment</li> </ul>	<ul style="list-style-type: none"> <li>-Installation of electrodes or metallic heating elements, SVE wells, and 6 additional monitoring wells</li> <li>-Pre- and post-application analyses of groundwater and soil samples from 10 wells and borings to evaluate the overall effectiveness of the treatment technology</li> <li>-Process monitoring during technology application to assess the effectiveness of treatment technique and above ground off-gas treatment system</li> <li>-Heat electrodes or elements</li> <li>-Operation of SVE system and vapor treatment system</li> </ul>	<ul style="list-style-type: none"> <li>Capital Cost: \$1,188,000</li> <li>Total O&amp;M Cost: \$0</li> <li>Present-Worth Cost: \$1,188,000</li> <li>Timeframe: 1 year</li> </ul>

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Alternative	Components	Details	Cost
<b>Excavation (SC-5)</b> <i>Mechanical removal of contaminated subsurface soil from source area and on site biopile treatment or off-site disposal of soil</i>	<ul style="list-style-type: none"> <li>-Pre-Design Investigation</li> <li>-Site Preparation and Mobilization</li> <li>-Excavation and Staging of Soil</li> <li>-Treatment of Excavation Water</li> <li>-Potential Enhanced Bioremediation in the Excavation</li> <li>-On-site Biopile Treatment</li> <li>-Potential Off-Site Disposal</li> <li>-Backfill and Site Restoration</li> </ul>	<ul style="list-style-type: none"> <li>-Collection and analysis of soil samples, bioremediation treatability study, and geotechnical investigation</li> <li>-Installation of sheet piling to reinforce Antenna Range Building (if necessary based on revised source area soil delineation)</li> <li>-Segregation and testing of excavated soils for placement in biopile(s) or temporary storage for backfilling. Post-excavation confirmatory sampling of sidewalls and base.</li> <li>-Treatment of water from the excavation using the Site 3 groundwater treatment system which includes oxidation, chemical addition, settling, sludge filtering, two stages of physical filtration, and GAC adsorption. Treated water discharged to the side of Hartwells Hill.</li> <li>-Potential addition of an oxygen-releasing compound into the excavation to accelerate biodegradation of groundwater COCs by naturally occurring microorganisms.</li> <li>-Aerobic bioremediation of contaminated soil with nutrient enhancement if necessary. Intermittent and post-treatment sampling to assess effectiveness.</li> <li>-Alternate disposal option (e.g., any soil that can not meet treatment standards).</li> <li>-Installation of stabilization layer to bottom of excavation, then backfill with stored clean soil and clean treated soil. Repaving or reseed surface area.</li> </ul>	<p>Capital Cost: \$805,000</p> <p>Total O&amp;M Cost: \$0</p> <p>Present-Worth Cost: \$805,000</p> <p>Timeframe: 1 year</p>

**Record Of Decision**  
**Naval Weapons Industrial Reserve Plant Bedford**  
**Part 2: The Decision Summary**

Alternative	Components	Details	Cost
<b>Migration Management</b> <b>No further Action (MM-1)</b> <i>No action for contaminated groundwater with no restriction on activities</i>	-Five-Year Reviews	-No action	Capital Cost: \$0  Total O&M Cost: Nominal  Present-Worth Cost: Nominal  Discount Rate: N/A  Timeframe: N/A
<b>Monitored Natural Attenuation (MM-2)</b> <i>Groundwater monitoring to access concentrations of COCs until performance standards have been achieved via natural attenuation</i>	-Monitoring  -Institutional Controls  -Five-Year Reviews	-Installation of wells along centerline, lateral and terminal edges of plume  -Periodic groundwater monitoring for natural attenuation indicator parameters and reporting  -On- and off-property institutional controls to restrict the use of groundwater so that the potential exposure pathway to contamination would remain incomplete until performance standards have been achieved. On-property institutional controls to restrict residential redevelopment and occupancy of site structures until a supplemental risk assessment is conducted showing no unacceptable risk.	Capital Cost: \$151,000  Total O&M Cost: \$420,000 to \$798,000  Present-Worth Cost: \$571,000 to \$949,000  Discount Rate: 2.8%  Timeframe: 10 to 25 years

**Record Of Decision**  
**Naval Weapons Industrial Reserve Plant Bedford**  
**Part 2: The Decision Summary**

Alternative	Components	Details	Cost
<b>Pump-and-Treat (MM-3)</b> <i>Groundwater management involving extraction, treatment, and discharge</i>	-Groundwater Extraction -Groundwater Treatment -Groundwater Management -Monitoring -Institutional Controls -Five-Year Reviews	-Extraction of groundwater from six wells at a rate of 2.3 gpm using pneumatic-bladder pumps or a jet pump system -Treatment of groundwater using the Site 3 IRA groundwater treatment system which includes oxidation, chemical addition, settling, sludge filtering, two stages of physical filtration, and GAC adsorption -Treated groundwater discharged to the side of Hartwells Hill -Installation of six new monitoring wells -Sampling and analysis of groundwater and recording of groundwater elevations to determine the capture zone and evaluate efficiency -Monitoring of extraction and treatment system to evaluate system effectiveness -On- and off-property institutional controls to restrict the use of groundwater so that the potential exposure pathway to contamination would remain incomplete until performance standards have been achieved. On-property institutional controls to restrict residential redevelopment and occupancy of site structures until a supplemental risk assessment is conducted showing no unacceptable risk.	Capital Cost: \$531,000 Total O&M Cost: \$1,996,000 Present-Worth Cost: \$2,527,000 Discount Rate: 2.6% Timeframe: 25 years
<b>Enhanced Bioremediation (MM-4)</b> <i>Addition of amendments to the subsurface to enhance the natural biodegradation of contaminants</i>	-Amendment Injection Points and Application -Monitoring -Institutional Controls -Five-Year Reviews	-Installation of 13 barriers of injection points oriented perpendicular to groundwater flow at regular intervals throughout the length of the plume -Injection of an oxygen-releasing compound to accelerate biodegradation by naturally occurring microorganisms -Installation of six monitoring wells -Baseline sampling, performance monitoring, and long-term monitoring -On- and off-property institutional controls to restrict the use of groundwater so that the potential exposure pathway to contamination would remain incomplete until performance standards have been achieved. On-property institutional controls to restrict residential redevelopment and occupancy of site structures until a supplemental risk assessment is conducted showing no unacceptable risk.	Capital Cost: \$1,597,000 Total O&M Cost: \$2,945,000 Present-Worth Cost: \$4,542,000 Discount Rate: 2.3% Timeframe: 5 years

ERH = Electrical resistance heating  
 gpm = Gallons per minute  
 SVE = Soil Vapor Extraction

GAC = Granular activated carbon  
 IRA = Immediate Response Action

**Record of Decision**  
**Naval Weapons Industrial Reserve Plant Bedford**  
**Part 2: The Decision Summary**

**TABLE 11**  
**COMPARATIVE ANALYSIS OF SITE-WIDE REMEDIAL ALTERNATIVES**  
**SITE 4 RECORD OF DECISION**  
**NWIRP BEDFORD, MASSACHUSETTS**

	Alt.1	Alt.2	Alt.3	Alt.4	Alt.5	Alt.6	Alt.7	Alt.8	Alt.9	Alt.10
<b>ALTERNATIVE DESCRIPTION/COMPONENTS</b>										
Source Area (SC)	SC-1 No Action	SC-2 P&T	SC-2 P&T	SC-3 ISCO	SC-4 ISTT	SC-3 ISCO	SC-4 ISTT	SC-3 ISCO	SC-4 ISTT	SC-5 Excavation
Groundwater Plume (MM)	MM-1 No Action	MM-3 P&T	MM-2 MNA	MM-2 MNA	MM-2 MNA	MM-3 P&T	MM-3 P&T	MM-4 Enh Bio	MM-4 Enh Bio	MM-2 MNA
<b>ESTIMATED TIMEFRAMES (YEARS)</b>										
Designing and constructing the alternative	NA	1	1	1	1	1	1	1	1	1
Achieving RAOs	NA	20-25	20-25	5-10	5-10	5-10	5-10	5	5	5-10
<b>CRITERIA ANALYSIS:</b>										
<b>Threshold Criteria</b>										
Protects human health and the environment	⊖	◇	◇	●	●	●	●	●	●	●
Compliance with ARARs										
Chemical -specific	⊖	◇	◇	●	●	●	●	●	●	●
Other	N/A	●	●	●	●	◇	◇	●	●	●
<b>Primary Balancing Criteria</b>										
Provides long-term, effectiveness and is permanent	⊖	◇	◇	◇	●	◇	●	◇	●	●
Reduces mobility toxicity, and volume of contaminants through treatment	⊖	◇	◇	◇	◇	●	●	●	●	◇
Provides short-term protection	⊖	◇	◇	◇	●	◇	●	◇	●	●
Can be implemented	⊖	◇	●	●	●	◇	◇	◇	◇	●
Cost										
Capital Costs (\$000)	0	943	564	726	1,337	1,105	1,716	2,171	2,098	956
Total O&M Costs (\$000)	Nominal	5,099	3,901	420	420	1,996	1,996	3,032	3,032	420
Total Present Worth Cost (\$000)	Nominal	6,041	4,465	1,145	1,757	3,101	3,712	5,202	5,130	1,376
<b>Modifying Criteria</b>										
State Agency Acceptance	See Appendix A.									
Community Acceptance	See Part 3 (Responsiveness Summary).									
Notes: P&T: Pump-and-Treat MNA: Monitored Natural Attenuation ISCO: In-situ Chemical Oxidation ISTT: In-situ Thermal Treatment Enh Bio: Enhanced Bioremediation ARARs: Applicable or relevant and appropriate requirements RAOs: Remedial Action Objectives										
● Good ◇ Average ⊖ Poor										

**Record of Decision**  
**Naval Weapons Industrial Reserve Plant Bedford**  
**Part 2: The Decision Summary**

**TABLE 12**  
**CAPITAL COST ESTIMATE FOR EXCAVATION AND DISPOSAL/BIOPILING OF BTEX-CONTAMINATED SOIL**

			Unit Cost (\$)				Total Cost(\$)				Total Direct	Comments
Item	Qty	Unit	Sub.	Mat.	Labor	Equip.	Sub.	Mat.	Labor	Equip.	Cost (\$)	
MOBILIZATION/DEMOBILIZATION												
1) Subcontractor mobilization/work plans	1	LS	60,000	0.00	0.00	0.00	60,000	0	0	0	60,000	vendor quote
2) Storage Trailer (1 ea)	2	MO	264.00	0.00	0.00	0.00	528	0	0	0	528	vendor quote
3) Office Trailer (1 ea)	2	MO	400.00	0.00	0.00	0.00	800	0	0	0	800	recent project cost
4) Pre-Design Investigation and Bench-Scale Study	1	LS	20,000.00	0.00	0.00	0.00	20,000	0	0	0	20,000	
Equip. Decon. Facilities and Services												
1) Truck Decon Pad (1 ea)												
a) Collection Sump	1	EA	0.00	2,358	1,237.98	375.66	0	2,358	1,238	376	3,972	past quotes
b) Splash Guard	1000	SF	0.00	2.03	2.48	0.00	0	2,033	2,476	0	4,509	past quotes
2) Decontamination Services	1	MO	2,772	0.00	0.00	0.00	2,772	0	0	0	2,772	past quotes
3) Decon Water (1000 gal/mo)	1000	GAL	0.26	0.00	0.00	0.00	264	0	0	0	264	
4) Clean Water Storage Tank	1	EA	0.00	4,879	742.79	0.00	0	4,879	743	0	5,622	1000 Gallon
5) Spent Water Storage Tank	1	EA	0.00	8,131	990.38	0.00	0	8,131	990	0	9,122	2000 Gallon
6) PPE rolloff container (monthly rental)	2	MO	924.00	0.00	0.00	0.00	1,848	0	0	0	1,848	vendor quote
7) Sump pumps (2)	2	EA	30,000.00	0.00	0.00	204.91	60,000	0	0	410	60,410	
DEWATERING OF EXCAVATIONS												
1) Dewatering excavations (treated on Site 03 GWTP)	60000	Gal	0.15	0.00	0.00	0.00	9,000	0	0	0	9,000	past quotes
STAGING AREA												
1) Prepare staging area with 40mil HDPE liner	1.0	LS	20,000.00	0.00	0.00	0.00	20,000	0	0	0	20,000	past quotes
OPTION 1: EXCAVATION/DISPOSAL												
1) Excavate BTEX contaminated soils	2167	CY	0.00	0.00	2.21	4.63	0	0	4,791	10,044	14,834	past quotes
2) Excavate and segregate clean soils	4940	CY	0.00	0.00	2.21	4.63	0	0	10,921	22,896	33,817	past quotes
3) Waste characterization sampling prior to disposal	8	EA	0.00	0.00	0.00	1,500.00	0	0	0	12,000	12,000	past quotes
4) Transportation & Disposal (non-RCRA waste)	3600	TON	132.00	0.00	0.00	0.00	475,200	0	0	0	475,200	vendor quote
OPTION 2: EXCAVATION/BIOPILE												
1) Excavate BTEX contaminated soils	2167	CY	0.00	0.00	2.21	4.63	0	0	4,791	10,044	14,834	past quotes

**Record of Decision  
Naval Weapons Industrial Reserve Plant Bedford  
Part 2: The Decision Summary**

Item	Qty	Unit	Unit Cost (\$)				Total Cost(\$)				Total Direct Cost (\$)	Comments
			Sub.	Mat.	Labor	Equip.	Sub.	Mat.	Labor	Equip.		
2) Excavate and segregate clean soils	4940	CY	0.00	0.00	2.21	4.63	0	0	10,921	22,896	33,817	past quotes
3) Create onsite biopile	2400	CY	60.00	0.00	0.00	0.00	144,000	0	0	0	144,000	vendor quote
<b>SHEETPILE INSTALLATION</b>												
1) Install and remove 80' deep sheet pile	7800	SF	21.77	0.00	0.00	0.00	169,806	0	0	0	169,806	vendor quote
<b>BACKFILLING/SITE RESTORATION</b>												
1) Import clean fill (a)	2520	CY	0.00	17.06	0.00	0.00	0	42,994	0	0	42,994	past quote
2) Add an oxygen-releasing compound to base of excavation	450	LBS	0.00	8.95	0.00	0.00	0	4,028	0	0	4,028	vendor quote
2) Backfill w/ front-end loader	2520	CY	0.00	0.00	1.99	1.60	0	0	5,014	4,034	9,048	[02315 120 3320]
3) Grade	600	SY	0.00	0.00	0.31	0.18	0	0	186	110	295	[02310 100 0200]
4) Compact 6-inch lifts, 3 passes	2520	CY	0.00	0.00	0.49	0.67	0	0	1,226	1,690	2,916	[02315 310 5620]
5) Asphaltic Concrete Pavement, Lots and Driveways	10850	SF	0.00	1.73	0.17	0.22	0	18,771	1,845	2,387	23,002	[18 05 0402]

(a) If Option 2 (excavation/biopile) is selected such that the treated soil can be used as backfill, then this line item (import clean fill) would not be required and the Option 2 total direct cost would be reduced to \$750,739.

**SUM OF TOTAL DIRECT COSTS (OPTION 1 - EXCAVATION/DISPOSAL)**

plus markup (10% engineering, 15% contingency)

820,218	83,192	29,428	53,946	982,757
---------	--------	--------	--------	---------

**1,233,481**

**SUM OF TOTAL DIRECT COSTS (OPTION 2 - EXCAVATION/BIOPILE)**

plus markup (10% engineering, 15% contingency)

489,018	83,192	29,428	41,946	639,557
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**804,481**

**Record of Decision  
Naval Weapons Industrial Reserve Plant Bedford  
Part 2: The Decision Summary**

**TABLE 13  
ESTIMATED COSTS FOR ALTERNATIVE MM-2: MONITORED NATURAL ATTENUATION**

	2001 Unit Cost (\$)	*2008 Unit Cost (\$)	Quantity	Total Cost (\$)	Present Value @ 2.8% (\$)
<b>DIRECT CAPITAL COST (\$)</b>					
Monitoring Well Installation	5,500	7,150	6	42,900	
<b>Institutional Controls</b>					
Institutional Controls Plan	25,000	32,500	1	32,500	
Groundwater Use Restriction	25,000	32,500	1	32,500	
<b>Total Direct Capital Cost</b>				<b>107,900</b>	
<b>INDIRECT CAPITAL COST (\$)</b>					
Engineering (10% of direct capital cost)				10,790	
Start-up/Shake-down (10 % of direct capital cost)				10,790	
Legal Costs (5% of direct capital cost)				5,395	
Contingency Costs (15% of direct capital cost)				16,185	
<b>Total Indirect Capital Cost</b>				<b>43,160</b>	
<b>Total Capital Cost (Direct + Indirect)</b>				<b>151,060</b>	
<b>OPERATING AND MAINTENANCE COST (\$)</b> (assume 10 years O&M)					
Monitoring Well Replacement (Year 10)	33,000	42,900	N/A	N/A	N/A
Annual Monitoring Well Repairs	4,000	5,200	10	52,000	44,813
Validation Monitoring and Reporting Occurs 2x/yr for Years 1 and 2	13,900	18,070	4	72,280	69,354
Long-term Monitoring and Reporting Occurs Annually for Years 3 through 10	22,900	29,770	8	238,160	199,426
Five Year Reviews (Years 5 and 10)	50,000	65,000	2	130,000	105,932
<b>Total O&amp;M Cost</b>				<b>492,440</b>	<b>419,526</b>
<b>TOTAL COST OF ALTERNATIVE (\$)</b>				<b>643,500</b>	<b>570,586</b>

\*- Unit costs from the 2001 FS were updated to 2008 costs using a multiplier of 1.3, derived from the construction cost index (CCI) published in the June 2008 issue of Engineering News - Record.

Note – Monitoring costs include annual IC compliance inspections.

N/A - Not applicable



**Record of Decision**  
**Naval Weapons Industrial Reserve Plant Bedford**  
**Part 3: The Responsiveness Summary**

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**PART 3: RESPONSIVENESS SUMMARY**

In May 2002, the Navy issued a Proposed Plan for Site 4 recommending In-situ Chemical Oxidation for soil and groundwater in the area of highest chemical concentrations, followed by MNA for the remaining site area. The Navy held a Public Hearing on the first Proposed Plan on May 14, 2002 and held a public comment period from May 1 to May 30, 2002. The public hearing transcript and written formal comments received during the 2002 public comment period are presented in Appendix E1 and Appendix E2, respectively.

The Proposed Plan activities from 2002 are superseded by the current (2009) Proposed Plan, Public Hearing, and Public Comment Period for the current selected remedy of Excavation and MNA. Accordingly, this Responsiveness Summary addresses public comments received on the June 2009 Proposed Plan. The public hearing transcript and written formal comments received during the 2009 public comment period are presented in Appendix E3 and Appendix E4, respectively.

Two comments were received during the Public Comment Period on the June 2009 Proposed Plan. The Navy and EPA believe that the comments have been addressed herein and that there is sufficient technical and legal basis to proceed with the Selected Remedy.

**Comment 1** – Submitted by John M. Stella, Bedford

*"I strongly supported the U.S. Navy proposed cleanup at the former Naval Industrial Weapons Reserve Plant in Bedford, MA. I would recommend the Navy should consider U.S. Navy Training Center or U.S. Navy Recruitment Center after the cleanup is over. This site would provide training for Naval Reserve."*

**Response:** The Navy appreciates your support of the Site 4 Proposed Plan and will forward your recommendation for property reuse to the U.S. General Services Administration (GSA) which is handling the property transfer and redevelopment.

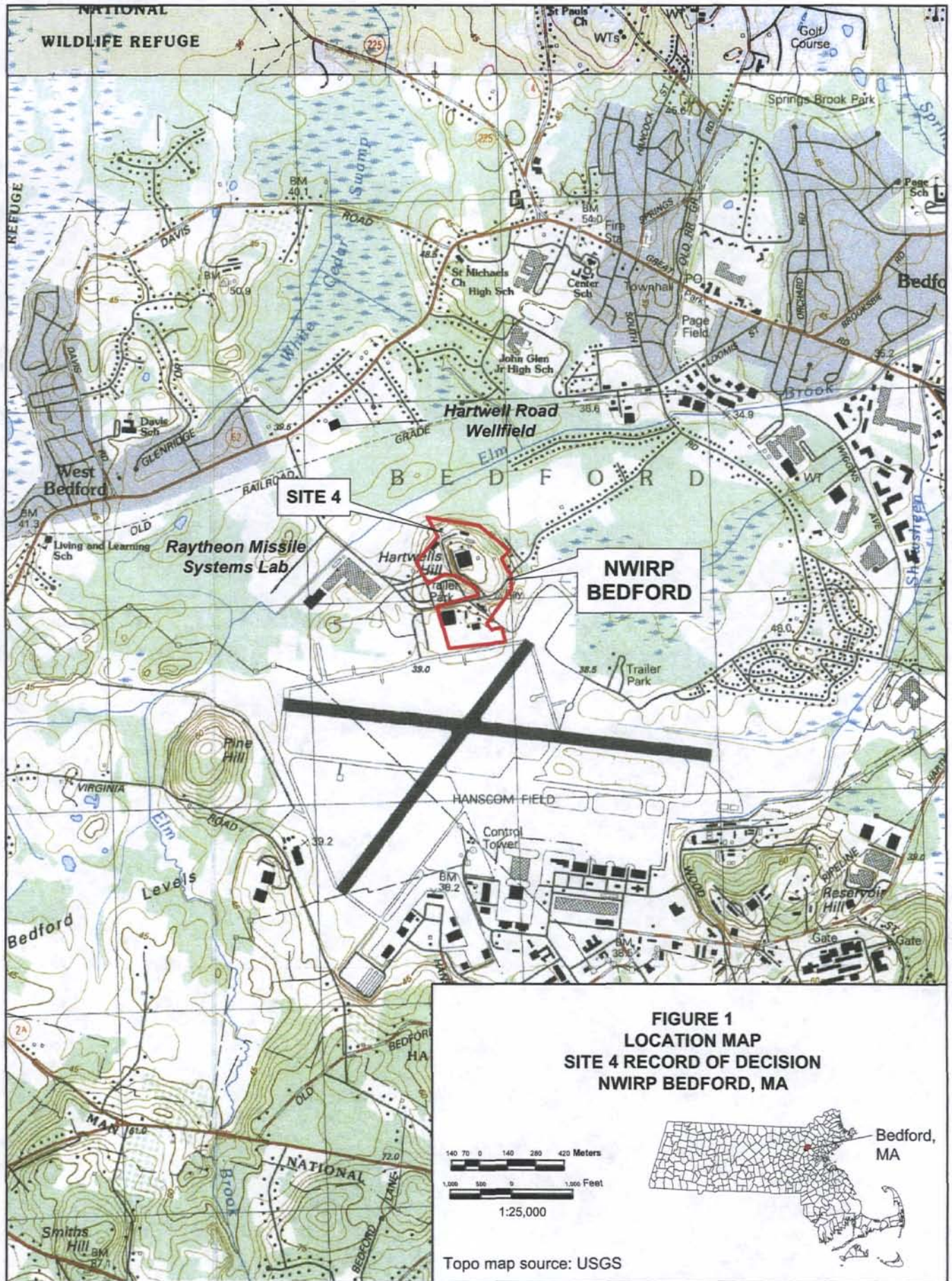
**Comment 2** – Presented by Donald Corey, RAB Co-Chair, during the July 14, 2009 Public Hearing

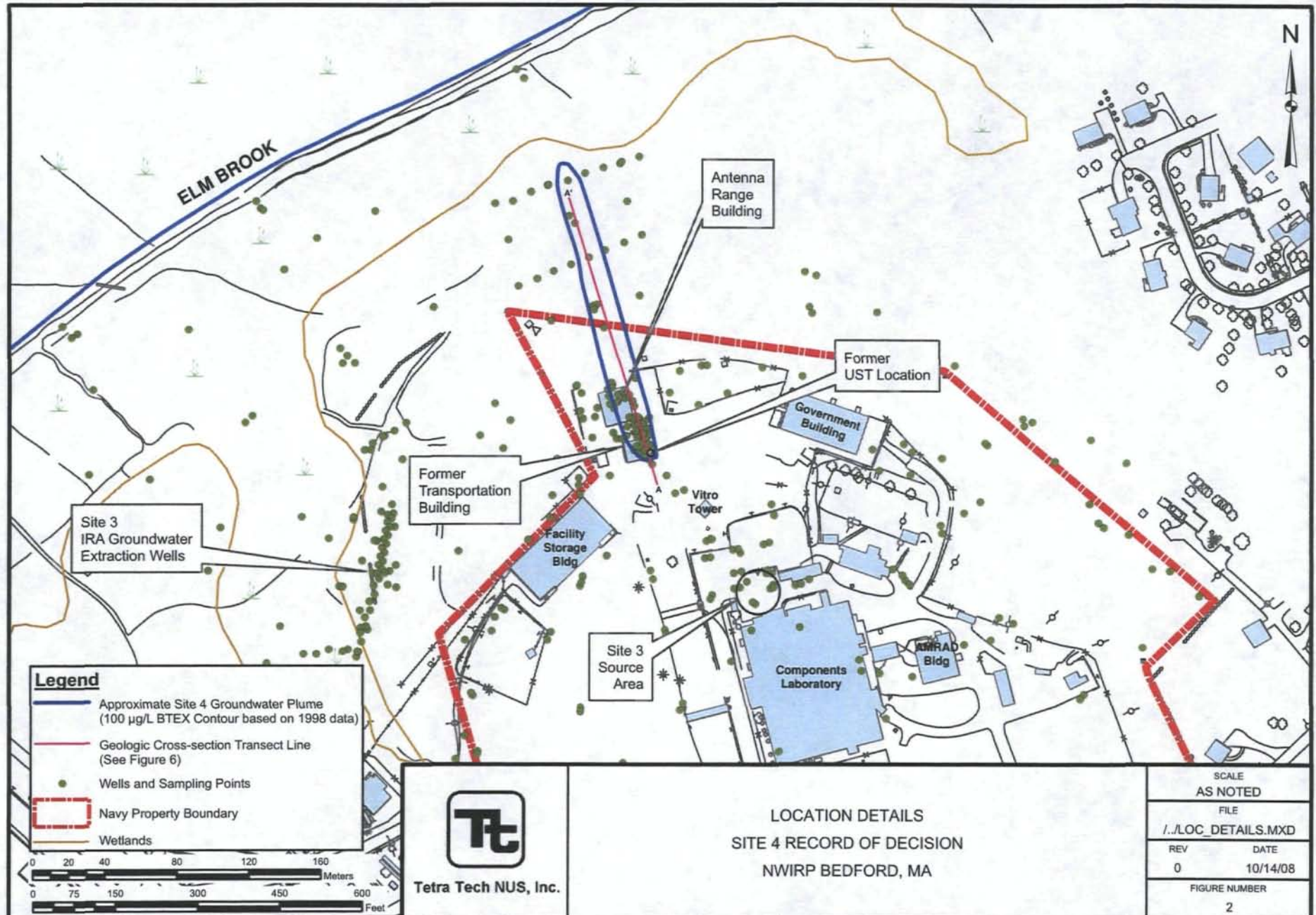
*"My name is Donald Corey. I'm the community co-chair for the RAB of Bedford, and the Town does intend to fully cooperate with the Navy on protecting groundwater and preventing use of groundwater in the area that's contaminated, and I anticipate that we will have a letter to the Navy before the end of the comment period."*

**Response:** The Navy appreciates the Town's support for the Site 4 Selected Remedy and will continue to work with the Town to implement interim Institutional Controls on groundwater until the cleanup is completed. A copy of the Town's letter is presented in Appendix H of this ROD.



## FIGURES





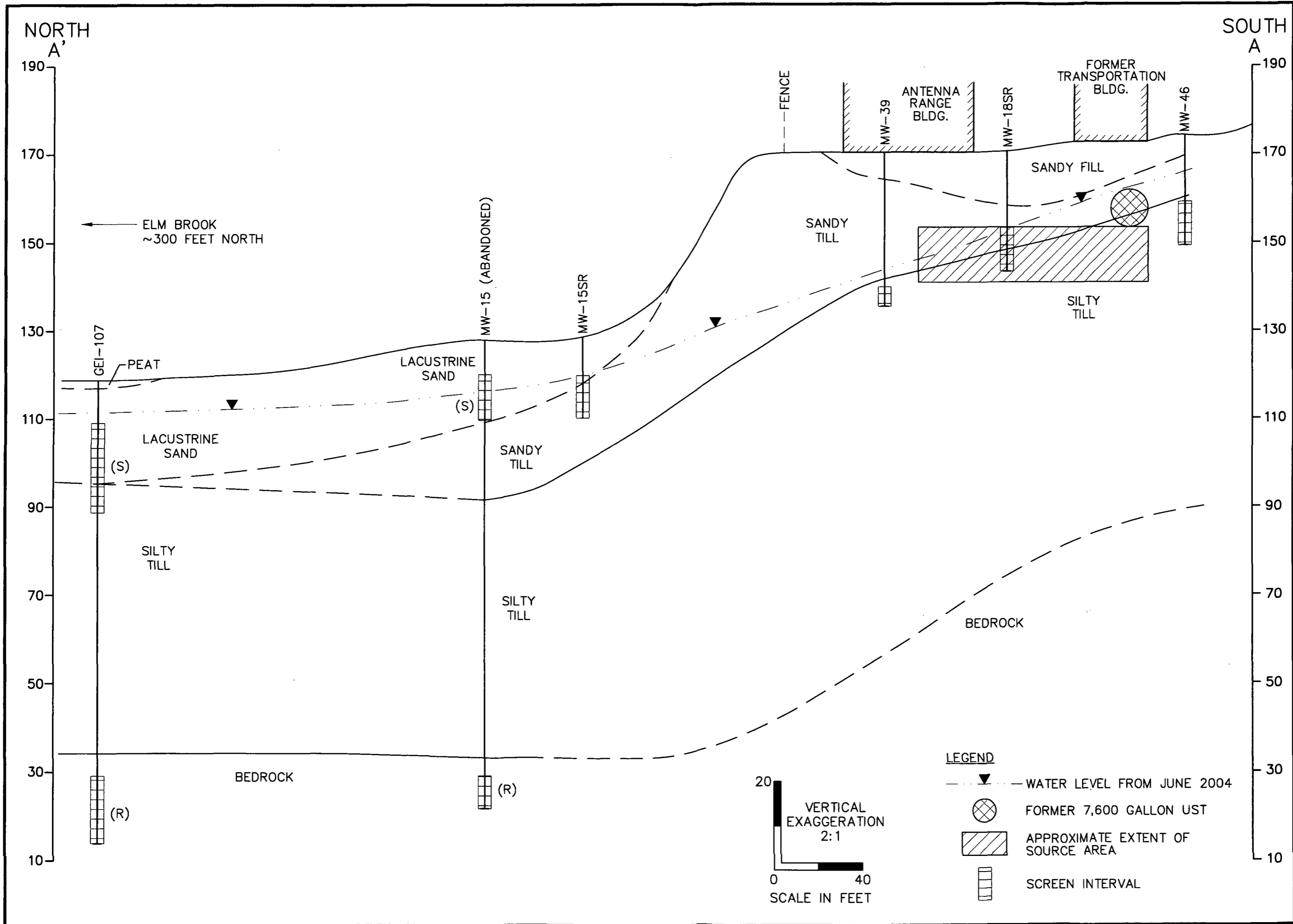
Tetra Tech NUS, Inc.

LOCATION DETAILS  
SITE 4 RECORD OF DECISION  
NWIRP BEDFORD, MA

SCALE  
AS NOTED

FILE	
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REV	DATE
0	10/14/08
FIGURE NUMBER	
2	

FILENAME: 05060-076-038.DWG



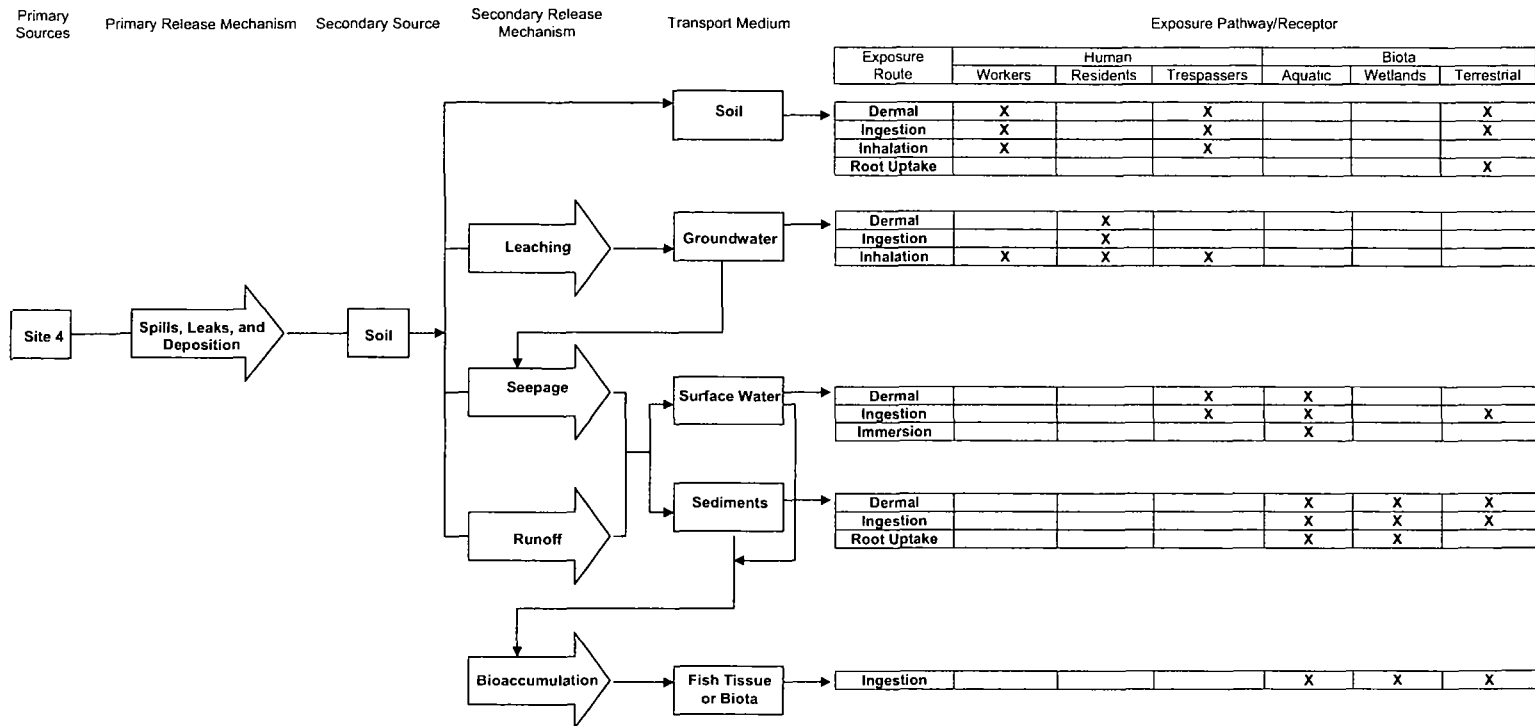
REVISIONS		NO.	DESCRIPTION	DATE	BY
DESIGNED BY:					
DRAWN BY:	J.E.B.				
CHECKED BY:	A.T.				
APPROVED BY:	A.T.				

**ENSR**  
INTERNATIONAL  
2 TECHNOLOGY PARK DRIVE  
WESTFORD, MASSACHUSETTS 01886  
PHONE: (978) 589-3000  
FAX: (978) 589-3100  
WEB: HTTP://WWW.ENSUR.COM

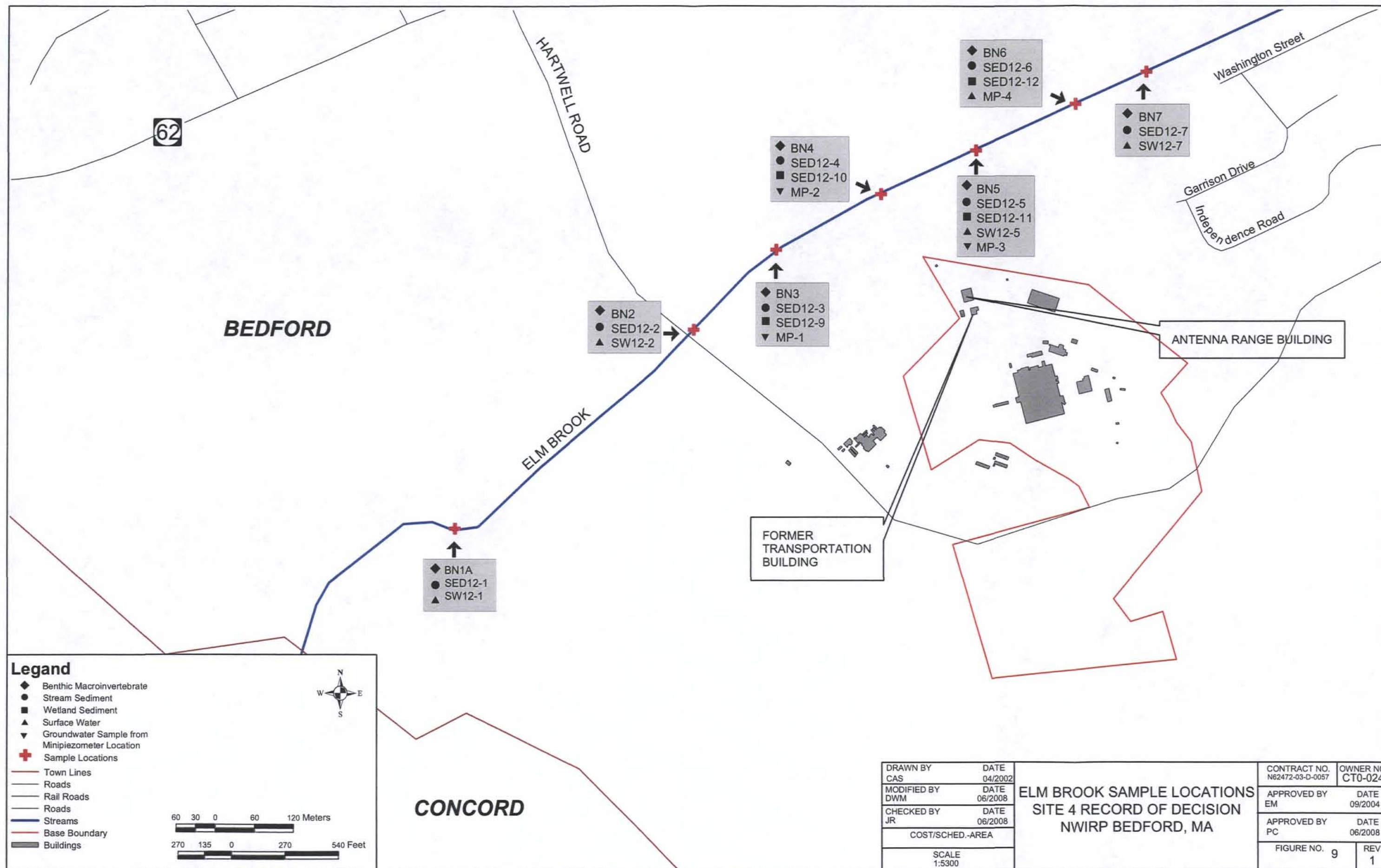
CROSS-SECTION A-A'	
SITE 4 RECORD OF DECISION	
NWRP BEDFORD	
SCALE:	AS SHOWN
DATE:	9/04
PROJECT NUMBER:	05060-076-400

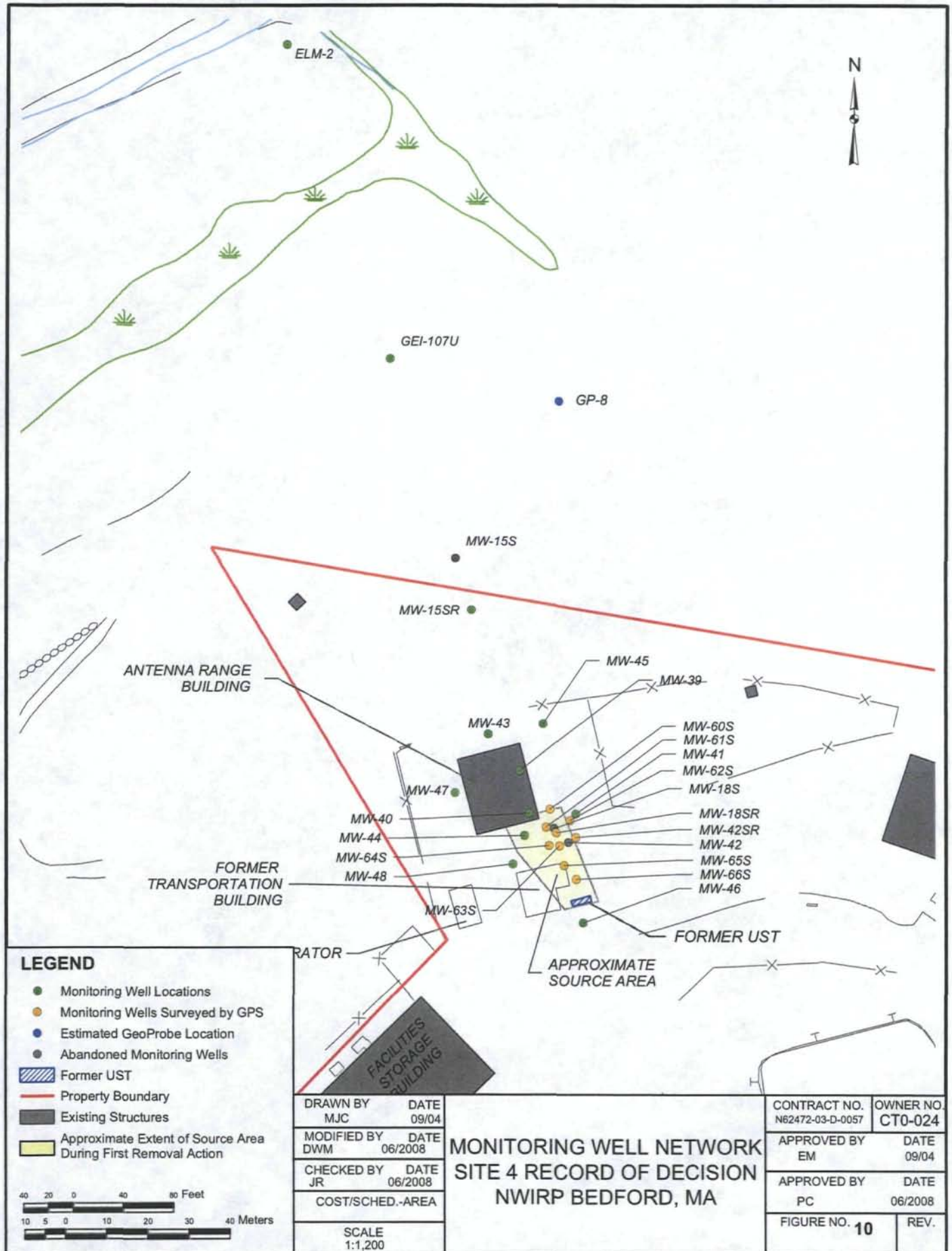
FIGURE NUMBER:
6
SHEET NUMBER:
1

Figure 7 – Site Conceptual Model













**Record of Decision  
Naval Weapons Industrial Reserve Plant, Bedford, MA  
Appendices**

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**Appendix A: MassDEP Statement on the Selected Remedy**

Refer to attached copy.



COMMONWEALTH OF MASSACHUSETTS  
EXECUTIVE OFFICE OF ENERGY & ENVIRONMENTAL AFFAIRS  
DEPARTMENT OF ENVIRONMENTAL PROTECTION

ONE WINTER STREET, BOSTON, MA 02108 617-292-5500

DEVAL L. PATRICK  
Governor

TIMOTHY P. MURRAY  
Lieutenant Governor

IAN A. BOWLES  
Secretary

LAURIE BURT  
Commissioner

September 16, 2009

Mr. James T. Owens, Director  
Office of Site Remediation and Restoration  
U.S. Environmental Protection Agency, Region I  
One Congress Street, Suite 1100  
Boston, MA 02114-2023

Re: State Concurrence with Record of Decision  
Naval Weapons Industrial Reserve Plant, Unit 4, Bedford, MA

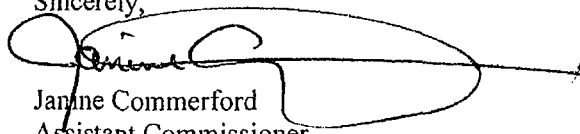
Dear Mr. Owens:

The Massachusetts Department of Environmental Protection (MassDEP) has reviewed the selected remedy recommended by the U.S. Environmental Protection Agency (EPA) for the cleanup of the Naval Weapons Industrial Reserve Plant (NWIRP) BTEX Plume (Site 4). MassDEP concurs with the selection of the remedy as presented in the Record of Decision.

The selected remedy consists of excavation and biopile treatment or off-site disposal of soil in the source area; the application of oxygen releasing compound (ORC) into the excavated source area to further reduce compounds of concern (COCs); monitored natural attenuation (MNA) of the groundwater plume; and institutional controls restricting the groundwater use, residential development, and occupancy of site structures. This remedy is comprehensive and addresses the principal site risks and the Remedial Action Objectives (RAOs) established for Site 4. The selected remedy also meets applicable or relevant and appropriate state requirements for the selected remedy.

If you have any questions or comments, please contact Anne Malewicz, Federal Facilities Section Chief at 617-292-5659.

Sincerely,



Janine Commerford  
Assistant Commissioner  
Bureau of Waste Site Cleanup

cc: Matthew Audet, U.S. EPA Region 1  
Maritza Montegross, NavFac Midplant  
RAB Members



**Record of Decision  
Naval Weapons Industrial Reserve Plant, Bedford, MA  
Appendices**

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**Appendix B: References**

Tetra Tech EC (TtEC), 2008. Final Closeout Report for Site 4 Thermal Treatment Remediation, NWIRP Bedford, MA. August 12.

Tetra Tech NUS, Inc. (TtNUS), 1999, Supplemental Investigation, Site 4, NWIRP Bedford, October.

TtNUS, 2000a, Draft Removal Action Evaluation Report, Site 4 BTEX Area, NWIRP Bedford, January. (Finalized via letter dated September 12, 2008.)

TtNUS, 2000b, Phase II Remedial Investigation, NWIRP Bedford, Final, September.

TtNUS, 2000c, Action Memorandum, Site 4, BTEX Area, NWIRP Bedford, Final, October.

TtNUS, 2001a, Feasibility Study, Site 4, NWIRP Bedford, Final, March.

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TtNUS, 2008b. Monitored Natural Attenuation Assessment for Site 4 – BTEX Plume, NWIRP Bedford. September.

TtNUS, 2009, Draft Site Management Plan, NWIRP Bedford. June.

U.S. Environmental Protection Agency (EPA), 1996a, Groundwater Use and Value Determination Guidance, EPA Region I, April 3.

U.S. EPA, 1999, A Guide to Preparing Superfund Proposed Plans, Records of Decision, and Other Remedy Selection Decision Documents. Office of Solid Waste and Emergency Response. PB98-963241.

U.S. EPA, 1999b, Letter from Patty Whittemore (EPA) to Robert Campbell (MassDEP) re: Review of the Massachusetts Groundwater Use and Value Determination for NWIRP Bedford, Massachusetts, August 5.

U.S. Navy, 2002, Proposed Plan, Operable Unit 4, Site 4, Naval Weapons Industrial Reserve Plant, Bedford, Massachusetts, May.

U.S. Navy, 2009, Proposed Plan, Site 4 – BTEX Plume, Naval Weapons Industrial Reserve Plant, Bedford, Massachusetts, June.

APPENDIX C

**Record of Decision**  
**Naval Weapons Industrial Reserve Plant, Bedford, MA**  
**Appendices**

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**Appendix C: Glossary**

Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA): A federal law passed in 1980 and amended in 1986 by the Superfund Amendments and Reauthorization Act (SARA). The Act created a special tax that goes into a Trust Fund, commonly known as Superfund, to investigate and clean up abandoned or uncontrolled hazardous waste sites. Navy compliance with CERCLA/SARA (see IR Program definition) is funded by the Department of Defense (DOD) under the Defense Environmental Restoration Act (DERA).

Chemicals of Concern (COCs): Compounds identified as a possible source of risk based upon a comparison between compound concentration and established screening levels (e.g., Federal Primary Drinking Water Standards).

Excess lifetime cancer risk range: Upper bound probability of an individual developing cancer as a result of a lifetime of exposure to a particular level of a potential carcinogen. The predicted cancer risk level is compared against an acceptable range of  $1 \times 10^{-4}$  to  $1 \times 10^{-6}$ .

Hazard Index (HI): A measure of the potential for toxic (non-cancer related) effects from exposure to non-carcinogenic chemicals. A Hazard Index of 1 or less is considered an acceptable risk level by EPA.

Installation Restoration (IR) Program: A component of the DERA created under CERCLA regulations and funded by the DOD. The purpose of the Program is to identify, assess, characterize, and clean up or control contamination from past hazardous waste disposal operation and hazardous material spills at military activities.

National Priorities List (NPL): EPA's list of sites for priority cleanup under the Superfund Program.

Operable Unit (OU): Operable units are site management tools that define discrete steps towards comprehensive actions, based on geographical portions of a site, specific site problems, initial phases of action, or any set of action performed over time or concurrently at different parts of the site.

Proposed Plan: A plan for site cleanup that is made available to the public for comment.

Remedial Investigation (RI): A summary report of the information collected on the nature and extent of contamination and the problems that the contamination could potentially cause (including assessment of human health and ecological risks) at a CERCLA site.

Zone II – A state-designated groundwater protection area (310 CMR 22.02) representing that area of an aquifer which contributes water to a well under the most severe pumping and recharge conditions that can be realistically anticipated (180 days of pumping at approved yield, with no recharge from precipitation). It is bounded by the groundwater divides which result from pumping the well and by the contact of the aquifer with less permeable materials such as till or bedrock. In some cases, streams or lakes may act as recharge boundaries. In all cases, Zone II shall extend upgradient to its point of intersection with prevailing hydrogeologic boundaries (a groundwater flow divide, a contact with till or bedrock, or a recharge boundary).

Zone III - A state-designated groundwater protection area (310 CMR 22.02) representing the land area beyond the area of Zone II from which surface water and groundwater drain into Zone II. The surface drainage area as determined by topography is commonly coincident with the groundwater drainage area and will be used to delineate Zone III. In some locations, where surface and groundwater drainage are not coincident, Zone III shall consist of both the surface drainage and the groundwater drainage areas.

10/10/10

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**Appendix D: Administrative Record Index**

DOCUMENT NUMBER	RECORD DATE	NUMBER OF PAGES	RECORD TYPE	TITLE	AUTHOR AFFILIATION	SITES ADDRESSED
N93880.AR.000002	4/1/1986	79	REPORT	INITIAL ASSESSMENT STUDY OF NWIRP BEDFORD MA	BCM EASTERN	
N93880.AR.000003	8/6/1986	7	CORRESPONDENCE	LETTER REGARDING THE DEPARTMENT OF ENVIRONMENTAL QUALITY ENGINEERING QUESTIONS AND COMMENTS ON THE INITIAL ASSESSMENT STUDY OF NWIRP BEDFORD MA	MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL QUALITY ENGINEERING	
N93880.AR.000004	9/30/1987	44	REPORT	PRELIMINARY ENVIRONMENTAL ASSESSMENT RAYTHEON SYSTEMS LABORATORY NWIRP BEDFORD MA	GOLDBERG-ZOINO & ASSOCIATES, INC.	
N93880.AR.000007	4/30/1988	4	CORRESPONDENCE	LETTER REGARDING U S NAVY RESPONSE TO REVIEW COMMENTS FROM MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL QUALITY ENGINEERING ON THE DRAFT WORK PLAN NWIRP BEDFORD MA	U S NAVY	
N93880.AR.000008	8/23/1988	20	CORRESPONDENCE	LETTER REGARDING THE U S NAVY'S COMMENTS ON THE DRAFT WORK PLAN FOR NWIRP BEDFORD MA	NAVFAC NORTHERN	
N93880.AR.000009	9/13/1988	7	CORRESPONDENCE	LETTER REGARDING REVIEW COMMENTS ON THE INTERNAL DRAFT WORK PLAN FOR THE NWIRP BEDFORD MA	MARTIN MARIETTA ENERGY SYSTEMS	
N93880.AR.000010	9/23/1988	27	MINUTES	MINUTES OF TECHNICAL REVIEW COMMITTEE MEETING HELD ON 23 SEPTEMBER 1988 NWIRP BEDFORD MA	U S NAVY	
N93880.AR.000790	10/18/1988	241	REPORT	REMEDIAL INVESTIGATION DRAFT WORK PLAN FOR NWIRP BEDFORD MA	DAMES & MOORE	
N93880.AR.000011	10/21/1988	1	CORRESPONDENCE	LETTER REQUESTING INVITATION TO PARTICIPATE IN THE TECHNICAL REVIEW COMMITTEE FOR INSTALLATION RESTORATION PROJECT AT NWIRP BEDFORD MA	NAVFAC NORTHERN	
N93880.AR.000012	10/21/1988	1	CORRESPONDENCE	LETTER REQUESTING INVITATION TO PARTICIPATE IN THE TECHNICAL REVIEW COMMITTEE FOR INSTALLATION RESTORATION PROJECT AT NWIRP BEDFORD MA	NAVFAC NORTHERN	
N93880.AR.000013	10/21/1988	1	CORRESPONDENCE	LETTER REQUESTING INVITATION TO PARTICIPATE IN THE TECHNICAL REVIEW COMMITTEE FOR INSTALLATION RESTORATION PROJECT AT NWIRP BEDFORD MA	NAVFAC NORTHERN	
N93880.AR.000014	10/21/1988	1	CORRESPONDENCE	LETTER REGARDING DRAFT WORK PLAN FOR REVIEW AND COMMENTS BY RAYTHEON NWIRP BEDFORD MA	NAVFAC NORTHERN	

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N93880.AR.000015	10/21/1988	1	CORRESPONDENCE	LETTER REGARDING REMEDIAL INVESTIGATION FEASIBILITY STUDY FOR REVIEW AND COMMENT BY U S EPA REGION I NWIRP BEDFORD MA	NAVFAC NORTHERN	
N93880.AR.000016	10/31/1988	1	CORRESPONDENCE	LETTER REQUESTING INVITATION TO PARTICIPATE IN THE TECHNICAL REVIEW COMMITTEE FOR INSTALLATION RESTORATION PROJECT AT NWIRP BEDFORD MA	U S AIR FORCE	
N93880.AR.000017	11/15/1988	5	CORRESPONDENCE	LETTER AND COMMENTS FROM THE U S NAVY AND RAYTHEON REGARDING DRAFT WORK PLAN FOR NWIRP BEDFORD MA	NAVFAC NORTHERN	
N93880.AR.000018	11/29/1988	6	CORRESPONDENCE	LETTER REGARDING THE DEPARTMENT OF ENVIRONMENTAL QUALITY ENGINEERING COMMENTS ON THE REMEDIAL INVESTIGATION DRAFT WORK PLAN FOR NWIRP BEDFORD MA	MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL QUALITY ENGINEERING	
N93880.AR.000019	11/30/1988	3	CORRESPONDENCE	LETTER REGARDING RESPONSE TO REVIEW COMMENTS FROM THE MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL QUALITY ENGINEERS ON THE REMEDIAL INVESTIGATION DRAFT WORK PLAN NWIRP BEDFORD MA	MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL QUALITY ENGINEERING	
N93880.AR.000020	12/1/1988	343	REPORT	GEOHYDROLOGIC STUDY SYSTEMS LABORATORY RAYTHEON VOLUME 1 AND 2 NWIRP BEDFORD MA	GOLDBERG-ZOINO & ASSOCIATES, INC.	
N93880.AR.000021	12/6/1988	19	CORRESPONDENCE	LETTER REGARDING REVIEW COMMENTS FROM THE U S NAVY, MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL QUALITY ENGINEERING AND MARTIN MARIETTA ENERGY SYSTEMS ON THE REMEDIAL INVESTIGATION DRAFT WORK PLAN FOR NWIRP BEDFORD MA	MARTIN MARIETTA ENERGY SYSTEMS	
N93880.AR.000022	12/14/1988	29	CORRESPONDENCE	SUMMARY OF COMMUNITY INTERVIEWS NWIRP BEDFORD MA		
N93880.AR.000023	12/22/1988	3	CORRESPONDENCE	LETTER REGARDING REVISIONS TO THE DRAFT WORK PLAN FOR THE NWIRP BEDFORD MA	MARTIN MARIETTA ENERGY SYSTEMS	
N93880.AR.000025	1/4/1989	1	CORRESPONDENCE	LETTER REGARDING THE U S NAVY'S APPROVAL TO THE REVISIONS MADE TO THE REMEDIAL INVESTIGATION DRAFT WORK PLAN FOR NWIRP BEDFORD MA	NAVFAC NORTHERN	
N93880.AR.000026	1/16/1989	1	CORRESPONDENCE	LETTER REGARDING THE FINAL WORK PLAN FOR THE NWIRP BEDFORD MA	MARTIN MARIETTA ENERGY SYSTEMS	
N93880.AR.000029	2/21/1989	17	MINUTES	MINUTES AND AGENDA FOR TECHNICAL REVIEW COMMITTEE MEETING HELD 12 FEBRUARY 1989 NWIRP BEDFORD MA	U S NAVY	

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N93880.AR.000030	3/1/1989	2	PUBLIC NOTICE	FACT SHEET RELEASE FOR INSTALLATION RESTORATION PROJECT NWIRP BEDFORD MA	U S NAVY	
N93880.AR.000031	8/16/1989	1	CORRESPONDENCE	LETTER REQUESTING A TECHNICAL MEMORANDUM SUMMARIZING THE RESULTS OF THE FIRST ROUND OF FIELD SAMPLING NWIRP BEDFORD MA	MARTIN MARIETTA ENERGY SYSTEMS	
N93880.AR.000032	11/22/1989	1	CORRESPONDENCE	MEMORANDUM REGARDING THE SECOND MEETING OF THE TECHNICAL REVIEW COMMITTEE FOR NWIRP BEDFORD MA	NAVFAC NORTHERN	
N93880.AR.000033	12/14/1989	15	MINUTES	MINUTES AND AGENDA FOR SECOND TECHNICAL REVIEW COMMITTEE MEETING HELD 14 DECEMBER 1989 NWIRP BEDFORD MA	U S NAVY	
N93880.AR.000035	1/30/1990	3	CORRESPONDENCE	LETTER AND COMMENTS BY MADEP REGARDING ISSUES TO ADEQUATELY DETERMINE THE EXTENT OF CONTAMINATION AT NWIRP BEDFORD MA	MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION	
N93880.AR.000036	2/1/1990	282	REPORT	TECHNICAL MEMORANDUM REMEDIAL INVESTIGATION FINDINGS NWIRP BEDFORD MA	DAMES & MOORE	
N93880.AR.000039	5/31/1990	3	CORRESPONDENCE	LETTER AND RESPONSE TO MADEP LETTER DATED 30 JANUARY 1990 REGARDING COMMENTS TO ADEQUATELY DETERMINE THE EXTENT OF CONTAMINATION AT NWIRP BEDFORD MA	NAVFAC NORTHERN	
N93880.AR.000040	7/11/1990	75	REPORT	SUPPLEMENTAL INVESTIGATION SITE ASSESSMENT AND SOIL GAS SURVEY REMEDIAL INVESTIGATION FINDINGS TEST AND ATTACHMENTS A THROUGH D WITH TRANSMITTAL LETTER NWIRP BEDFORD MA	DAMES & MOORE	
N93880.AR.000041	7/13/1990	1	CORRESPONDENCE	MEMORANDUM REGARDING THE THIRD MEETING OF THE TECHNICAL REVIEW COMMITTEE FOR NWIRP BEDFORD MA	NAVFAC NORTHERN	
N93880.AR.000043	8/6/1990	1	CORRESPONDENCE	LETTER REGARDING AGENDA FOR THE TECHNICAL REVIEW COMMITTEE MEETING HELD 6 AUGUST 1990 NWIRP BEDFORD MA	NAVFAC NORTHERN	
N93880.AR.000045	12/6/1990	5	CORRESPONDENCE	LETTER REGARDING THE PURPOSE AND SCOPE OF A PHASE 2 COMPREHENSIVE SITE ASSESSMENT AS REQUIRED BY THE MASSACHUSETTS CONTINGENCY PLAN AT NWIRP BEDFORD MA	MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION	
N93880.AR.000050	2/5/1991	62	REPORT	FINAL PRELIMINARY ASSESSMENT REPORT NWIRP BEDFORD MA	NAVAL ENERGY AND ENVIRONMENTAL SUPPORT ACTIVITY	

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N93880.AR.000058	7/15/1991	5	CORRESPONDENCE	LETTER REGARDING DOCUMENTATION OF REMAINING ACTIVITIES NWIRP BEDFORD MA	DAMES & MOORE	
N93880.AR.000063	8/31/1991	2	CORRESPONDENCE	LETTER REGARDING REMEDIAL INVESTIGATION FEASIBILITY STUDY NWIRP BEDFORD MA	NAVFAC NORTHERN	
N93880.AR.000064	9/4/1991	43	REPORT	TECHNICAL PROPOSAL LITIGATION SUPPORT AND GROUNDWATER MODELING SERVICES NWIRP BEDFORD MA	DAMES & MOORE	
N93880.AR.000065	9/6/1991	2	CORRESPONDENCE	LETTER REGARDING EVALUATION BY THE U S EPA REGION I IN ACCORDANCE WITH CRITERIA ESTABLISHED UNDER THE NATIONAL CONTINGENCY PLAN NWIRP BEDFORD MA	U S EPA REGION I	
N93880.AR.000076	10/30/1991	3	CORRESPONDENCE	LETTER AND COMMENTS FROM U S EPA REGION I REGARDING SITE ASSESSMENT NWIRP BEDFORD MA	U S EPA REGION I	
N93880.AR.000078	11/14/1991	2	CORRESPONDENCE	LETTER TO CONFIRM AND DOCUMENT TELEPHONE CONVERSATION ON 22 OCTOBER 1991 REGARDING CURRENT STATUS OF PHASE 2 HAZARDOUS MATERIALS INVESTIGATION CONDUCTED AT NWIRP BEDFORD MA	MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION	
N93880.AR.000079	11/15/1991	4	CORRESPONDENCE	LETTER REGARDING REVIEW COMMENTS FOR GEI RISK ASSESSMENT AND GROUNDWATER MODELING PLAN NWIRP BEDFORD MA	DAMES & MOORE	
N93880.AR.000073	11/18/1991	2	CORRESPONDENCE	LETTER REGARDING THE STATUS OF THE INSTALLATION RESTORATION PROGRAM AT NWIRP BEDFORD MA	NAVFAC NORTHERN	
N93880.AR.000080	12/5/1991	10	CORRESPONDENCE	LETTER AND REVIEW COMMENTS ON THE REMEDIAL INVESTIGATION/FEASIBILITY STUDY NWIRP BEDFORD MA	DAMES & MOORE	
N93880.AR.000081	12/20/1991	15	CORRESPONDENCE	LETTER REGARDING SUMMARY OF ADDITIONAL FIELD DATA COLLECTED IN NOVEMBER 1991 OF WELL FIELD AT NWIRP BEDFORD MA	HALEY AND ALDRICH	
N93880.AR.000097	3/17/1992	7	CORRESPONDENCE	LETTER REGARDING REVIEW OF PHASE 2 REMEDIAL INVESTIGATION WORK PLAN NWIRP BEDFORD MA	GEI CONSULTANTS, INC.	
N93880.AR.000098	4/10/1992	7	CORRESPONDENCE	LETTER REGARDING PHASE 2 WORK PLAN RAYTHEON FACILITY NWIRP BEDFORD MA	U S EPA REGION I	
N93880.AR.000099	4/15/1992	3	OTHER	U S NAVY'S RESPONSES TO "WBZ-TV" QUESTIONS REGARDING ENVIRONMENTAL ISSUES AT NWIRP BEDFORD MA	NAVFAC NORTHERN	

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N93880.AR.000785	4/23/1992	63	REPORT	DRAFT INTERIM REMEDIAL MEASURE DESIGN PLAN OF ACTION/WORK PLAN NWIRP BEDFORD MA	HALLIBURTON NUS ENVIRONMENTAL CORPORATION	
N93880.AR.000100	5/1/1992	98	REPORT	FINAL PHASE 2 REMEDIAL INVESTIGATION WORK PLAN WITH TRANSMITTAL LETTER NWIRP BEDFORD MA	ENSR CONSULTING AND ENGINEERING	
N93880.AR.000101	5/1/1992	369	REPORT	FINAL PHASE 2 REMEDIAL INVESTIGATION SAMPLING AND ANALYSIS PLAN NWIRP BEDFORD MA	HALLIBURTON NUS ENVIRONMENTAL CORPORATION	
N93880.AR.000107	7/27/1992	3	CORRESPONDENCE	LETTER WITH MARTIN MARIETTA HAZARDOUS WASTE REMEDIAL ACTION PROGRAM COMMENTS REGARDING DRAFT REPORT OF OBSERVATIONS NWIRP BEDFORD MA	NAVFAC NORTHEAST	
N93880.AR.000109	8/1/1992	253	REPORT	TECHNICAL MEMORANDUM OF REMEDIAL INVESTIGATIONS NWIRP BEDFORD MA	DAMES & MOORE	
N93880.AR.000110	8/1/1992	28	REPORT	DRAFT REPORT OF OBSERVATIONS NWIRP BEDFORD MA	MARTIN MARIETTA ENERGY SYSTEMS	
N93880.AR.000116	9/30/1992	1	CORRESPONDENCE	MEMORANDUM REGARDING THE FOURTH MEETING OF THE TECHNICAL REVIEW COMMITTEE FOR NWIRP BEDFORD MA	NAVFAC NORTHERN	
N93880.AR.000857	10/7/1992	7	MINUTES	MEETING MINUTES FROM THE FOURTH TECHNICAL REVIEW COMMITTEE HELD ON 7 OCTOBER 1992 NWIRP BEDFORD MA	ENSR CONSULTING AND ENGINEERING	
N93880.AR.000117	10/15/1992	16	MINUTES	MINUTES OF THE FOURTH TECHNICAL REVIEW COMMITTEE MEETING ON 7 OCTOBER 1992 NWIRP BEDFORD MA	ENSR CONSULTING AND ENGINEERING	
N93880.AR.000118	11/1/1992	54	REPORT	COMMUNITY RELATIONS PLAN WITH TRANSMITTAL LETTER FOR NWIRP BEDFORD MA	HALLIBURTON NUS ENVIRONMENTAL CORPORATION	
N93880.AR.000119	11/1/1992	25	ANALYTICAL DATA	SAMPLING DATA FROM NOVEMBER 1992 PHASE 2 REMEDIAL INVESTIGATION SEDIMENT SAMPLING EVENT WITH VALIDATION MEMOS NWIRP BEDFORD MA		
N93880.AR.000120	11/25/1992	3	CORRESPONDENCE	LETTER REGARDING THE PRESS RELEASE ANNOUNCING THE PROJECTS AT NWIRP BEDFORD MA	ENSR CONSULTING AND ENGINEERING	
N93880.AR.000121	12/1/1992	30	ANALYTICAL DATA	SAMPLING DATA FROM DECEMBER 1992 PHASE 2 REMEDIAL INVESTIGATION SOIL SAMPLING EVENT WITH VALIDATION MEMOS NWIRP BEDFORD MA		

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N93880.AR.000122	12/2/1992	1	OTHER	U S NAVY'S RESPONSES TO "BEDFORD MINUTEMAN" QUESTIONS REGARDING ENVIRONMENTAL ISSUES AT NWIRP BEDFORD MA	NAVFAC NORTHERN	
N93880.AR.000124	12/21/1992	3	MINUTES	MINUTES OF THE FIRST COMMUNITY MEETING ON 16 NOVEMBER 1992 NWIRP BEDFORD MA	ENSR CONSULTING AND ENGINEERING	
N93880.AR.000127	4/22/1993	5	CORRESPONDENCE	MEMORANDUM REGARDING THE FIFTH TECHNICAL REVIEW COMMITTEE MEETING 29 APRIL 1993 WITH AGENDA NWIRP BEDFORD MA	NAVFAC NORTHERN	
N93880.AR.000786	5/11/1993	35	REPORT	ORGANIC DATA VALIDATION VOLATILES AND SEMIVOLATILES WITH COVER LETTER NWIRP BEDFORD MA	ENSR CONSULTING AND ENGINEERING	
N93880.AR.000787	5/12/1993	95	REPORT	INORGANIC DATA VALIDATION TAL METALS AND CYANIDE WITH COVER LETTER NWIRP BEDFORD MA	ENSR CONSULTING AND ENGINEERING	
N93880.AR.000131	6/1/1993	44	REPORT	SITE INVESTIGATION REPORT NWIRP BEDFORD MA	HALLIBURTON NUS ENVIRONMENTAL CORPORATION	
N93880.AR.000132	6/1/1993	28	REPORT	GEOTECHNICAL REPORT FOR NWIRP BEDFORD MA	HALLIBURTON NUS ENVIRONMENTAL CORPORATION	
N93880.AR.000133	6/23/1993	1	CORRESPONDENCE	LETTER REGARDING A DELAY IN THE NATIONAL PRIORITIES LIST UPDATE NUMBER 15 NWIRP BEDFORD MA	U S EPA REGION I	
N93880.AR.000134	6/23/1993	1	OTHER	U S NAVY'S RESPONSES TO "THE SUN" QUESTIONS REGARDING ENVIRONMENTAL ISSUES AT NWIRP BEDFORD MA	NAVFAC NORTHERN	
N93880.AR.000136	11/16/1993	24	CORRESPONDENCE	LETTER REGARDING EXECUTIVE SUMMARY DATA PACKAGES DISCUSSED AT MEETING 9 NOVEMBER 1993 NWIRP BEDFORD MA	ENSR CONSULTING AND ENGINEERING	
N93880.AR.000137	11/22/1993	3	CORRESPONDENCE	LETTER REGARDING REMEDIAL INVESTIGATION PHASE 2 DATA PACKAGE NWIRP BEDFORD MA	U S NAVY	
N93880.AR.000138	1/1/1994	343	REPORT	DRAFT PHASE 2 REMEDIAL INVESTIGATION NWIRP BEDFORD MA	HALLIBURTON NUS ENVIRONMENTAL CORPORATION	
N93880.AR.000139	1/24/1994	18	CORRESPONDENCE	LETTER REGARDING SCOPE CHANGE FOR THE REMEDIAL INVESTIGATION PHASE 2 FIELD WORK, RISK ASSESSMENT AND REPORT AS REQUESTED IN THE U S NAVY RECORD OF CHANGE MEMORANDUM DATED 15 DECEMBER 1993 NWIRP BEDFORD MA	HALLIBURTON NUS ENVIRONMENTAL CORPORATION	

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N93880.AR.000140	2/1/1994	75	REPORT	MASSACHUSETTS CONTINGENCY PLAN RISK ASSESSMENT SCOPE OF WORK PHASE 2 REMEDIAL INVESTIGATION NWIRP BEDFORD MA	HALLIBURTON NUS ENVIRONMENTAL CORPORATION	
N93880.AR.000143	9/23/1994	10	CORRESPONDENCE	LETTER REGARDING SITE RANKING AND SITE SUMMARY NWIRP BEDFORD MA	U S DEPARTMENT OF HEALTH AND HUMAN SERVICES	
N93880.AR.000144	10/1/1994	772	REPORT	DRAFT FINAL REMEDIAL INVESTIGATION PHASE 2 REPORT VOLUME 2 OF 2 APPENDICES NWIRP BEDFORD MA	HALLIBURTON NUS ENVIRONMENTAL CORPORATION	
N93880.AR.000145	10/1/1994	374	REPORT	DRAFT REMEDIAL INVESTIGATION PHASE 2 REPORT VOLUME 1 OF 2 NWIRP BEDFORD MA	HALLIBURTON NUS ENVIRONMENTAL CORPORATION	
N93880.AR.000146	11/1/1994	176	REPORT	FINAL BASELINE HUMAN HEALTH AND ECOLOGICAL RISK ASSESSMENT WORK PLAN WITH TRANSMITTAL LETTER NWIRP BEDFORD MA	ENSR CONSULTING AND ENGINEERING	
N93880.AR.000147	11/15/1994	2	CORRESPONDENCE	LETTER REGARDING THE TRANSMITTAL OF THE BASELINE HUMAN HEALTH AND ECOLOGICAL RISK ASSESSMENT WORK PLAN NWIRP BEDFORD MA	ENSR CONSULTING AND ENGINEERING	
N93880.AR.000148	11/30/1994	19	CORRESPONDENCE	LETTER REGARDING REMEDIAL INVESTIGATION PHASE 2 FIELD WORK RISK ASSESSMENT AND REPORT NWIRP BEDFORD MA	HALLIBURTON NUS ENVIRONMENTAL CORPORATION	
N93880.AR.000149	12/2/1994	4	CORRESPONDENCE	LETTER AND COMMENTS FROM MADEP REGARDING THE RESPONSES TO THE 8 NOVEMBER 1994 NOTICE OF RESPONSIBILITY LETTER NWIRP BEDFORD MA	MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION	
N93880.AR.000150	12/9/1994	5	CORRESPONDENCE	LETTER REGARDING DRAFT FACT SHEET NWIRP BEDFORD MA	ENSR CONSULTING AND ENGINEERING	
N93880.AR.000151	2/7/1995	29	CORRESPONDENCE	LETTER AND COMMENTS FROM THE U S EPA REGION I REGARDING DRAFT FINAL REMEDIAL INVESTIGATION REPORT NWIRP BEDFORD MA	U S EPA REGION I	
N93880.AR.000152	3/31/1995	7	CORRESPONDENCE	LETTER REGARDING MEETING ANNOUNCEMENT WITH AGENDA TO BE HELD ON 4 APRIL 1995 NWIRP BEDFORD MA	ENSR CONSULTING AND ENGINEERING	
N93880.AR.000154	5/1/1995	15	CORRESPONDENCE	LETTER REGARDING REMEDIAL INVESTIGATION PHASE 2 FIELD WORK RISK ASSESSMENT AND REPORT NWIRP BEDFORD MA	HALLIBURTON NUS ENVIRONMENTAL CORPORATION	
N93880.AR.000155	5/11/1995	42	CORRESPONDENCE	LETTER WITH U S NAVY RESPONSES TO U S EPA REGION I COMMENTS DATED 17 FEBRUARY 1995 REGARDING THE BASELINE HUMAN HEALTH AND ECOLOGICAL RISK ASSESSMENT WORK PLAN NWIRP BEDFORD MA	ENSR CONSULTING AND ENGINEERING	

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N93880.AR.000157	5/25/1995	36	CORRESPONDENCE	LETTER OF U S NAVY RESPONSES TO U S EPA REGION I COMMENTS DATED 7 FEBRUARY 1995 REGARDING THE DRAFT FINAL REMEDIAL INVESTIGATION REPORT NWIRP BEDFORD MA	U S NAVY	
N93880.AR.000158	6/13/1995	6	CORRESPONDENCE	LETTER AND COMMENTS TO RESPONSES REGARDING BASELINE HUMAN HEALTH AND ECOLOGICAL RISK ASSESSMENT WORK PLAN NWIRP BEDFORD MA	U S EPA REGION I	
N93880.AR.000162	7/5/1995	2	CORRESPONDENCE	LETTER REGARDING THE SUMMARY OF THE TELEPHONE CONFERENCE CALL OF 29 JUNE 1995 NWIRP BEDFORD MA	MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION	
N93880.AR.000163	8/1/1995	264	REPORT	BASELINE HUMAN HEALTH AND ECOLOGICAL RISK ASSESSMENT WORK PLAN WITH TRANSMITTAL LETTER NWIRP BEDFORD MA	HALLIBURTON NUS ENVIRONMENTAL CORPORATION	
N93880.AR.000164	8/7/1995	2	PUBLIC NOTICE	PUBLIC NOTICE FOR PUBLIC MEETING 13 SEPTEMBER 1995 NWIRP BEDFORD MA	NAVFAC NORTHERN	
N93880.AR.000172	12/12/1995	1	CORRESPONDENCE	MEMORANDUM REGARDING SCOPE CHANGE TO RISK ASSESSMENT GROUNDWATER MODELING NWIRP BEDFORD MA	NAVFAC NORTHERN	
N93880.AR.000177	2/9/1996	1	CORRESPONDENCE	LETTER REGARDING CHEMICAL OF CONCERN SELECTION FOR THE HUMAN HEALTH RISK ASSESSMENT NWIRP BEDFORD MA	ENSR CONSULTING AND ENGINEERING	
N93880.AR.000183	3/1/1996	151	REPORT	FATE AND TRANSPORT MODELING REPORT WITH TRANSMITTAL LETTER NWIRP BEDFORD MA	ENSR CONSULTING AND ENGINEERING	
N93880.AR.000186	3/6/1996	1	PUBLIC NOTICE	NEWSPAPER NOTICE FOR RESTORATION ADVISORY BOARD MEETING 6 MARCH 1996 NWIRP BEDFORD MA	BEDFORD MINUTEMAN	
N93880.AR.000187	3/11/1996	2	CORRESPONDENCE	LETTER REGARDING BASELINE HUMAN HEALTH AND ECOLOGICAL RISK ASSESSMENT WORK PLAN NWIRP BEDFORD MA	U S EPA REGION I	
N93880.AR.000188	3/18/1996	58	CORRESPONDENCE	LETTER REGARDING MEETING MINUTES, RESPONSE TO COMMENTS, WORK PLAN TABLE REVISIONS, CONFERENCE CALL NOTES, FINAL COMPOUND OF CONCERN LIST AND SUMMARY AND BASELINE HUMAN HEALTH AND ECOLOGICAL RISK ASSESSMENT WORK PLAN AUGUST 1995 NWIRP BEDFORD MA	ENSR CONSULTING AND ENGINEERING	
N93880.AR.000189	4/1/1996	1	CORRESPONDENCE	LETTER REGARDING THE TRANSMITTAL OF THE DRAFT FATE AND TRANSPORT MODELING REPORT NWIRP BEDFORD MA	ENSR CONSULTING AND ENGINEERING	

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N93880.AR.000192	4/16/1996	5	CORRESPONDENCE	LETTER REGARDING DRAFT FATE AND TRANSPORT MODELING REPORT NWIRP BEDFORD MA	U S EPA REGION I	
N93880.AR.000194	5/8/1996	1	PUBLIC NOTICE	NEWSPAPER NOTICE FOR RESTORATION ADVISORY BOARD MEETING 8 MAY 1996 NWIRP BEDFORD MA	LEXINGTON MINUTEMAN	
N93880.AR.000205	8/7/1996	1	PUBLIC NOTICE	NEWSPAPER NOTICE FOR RESTORATION ADVISORY BOARD MEETING 7 AUGUST 1996 NWIRP BEDFORD MA	LEXINGTON MINUTEMAN	
N93880.AR.000208	8/22/1996	2	CORRESPONDENCE	MEMORANDUM OF SUGGESTED RESPONSES TO BEDFORD MINUTEMAN QUESTIONS NWIRP BEDFORD MA	NAVFAC NORTHERN	
N93880.AR.000209	8/27/1996	52	REPORT	DRAFT PHASE 2 REMEDIAL INVESTIGATION REPORT AUGUST 1996 PART 1 FIELD INVESTIGATION RESULTS VOLUME 1 AND 2 AND PART 2 BASELINE HUMAN HEALTH AND ECOLOGICAL RISK ASSESSMENT WITH TRANSMITTAL LETTER NWIRP BEDFORD MA	ENSR CONSULTING AND ENGINEERING	
N93880.AR.000210	8/29/1996	1	PUBLIC NOTICE	NEWSPAPER ARTICLE "NAVY HAS PLAN TO CLEAN UP ITS CHEMICAL MESS" NWIRP BEDFORD MA	BEDFORD MINUTEMAN	
N93880.AR.000215	10/24/1996	1	PUBLIC NOTICE	NEWSPAPER NOTICE FOR RESTORATION ADVISORY BOARD MEETING 24 OCTOBER 1996 NWIRP BEDFORD MA	LEXINGTON MINUTEMAN AND BEDFORD MINUTEMAN	
N93880.AR.000220	2/1/1997	94	REPORT	DRAFT FIELD SAMPLING PLAN BASELINE ENVIRONMENTAL MONITORING NWIRP BEDFORD MA	BROWN AND ROOT ENVIRONMENTAL	
N93880.AR.000222	2/1/1997	149	REPORT	PHASE 2 REMEDIAL INVESTIGATION GROUNDWATER SAMPLE COLLECTION RECORDS FEBRUARY 1997 NWIRP BEDFORD MA		
N93880.AR.000223	2/6/1997	47	MINUTES	DRAFT MEETING MINUTES OF 6 FEBRUARY 1997 RESTORATION ADVISORY BOARD MEETING NWIRP BEDFORD MA	ENSR CONSULTING AND ENGINEERING	
N93880.AR.000224	2/6/1997	1	PUBLIC NOTICE	NEWSPAPER NOTICE FOR RESTORATION ADVISORY BOARD MEETING 6 FEBRUARY 1997 NWIRP BEDFORD MA	BEDFORD MINUTEMAN	
N93880.AR.000226	4/1/1997	287	REPORT	DRAFT SUMMARY DATA PACKAGE BASELINE ENVIRONMENTAL MONITORING WITH TRANSMITTAL LETTER NWIRP BEDFORD MA	BROWN AND ROOT ENVIRONMENTAL	
N93880.AR.000225	4/3/1997	110	REPORT	FIRST QUARTERLY GROUNDWATER MONITORING REPORT WITH TRANSMITTAL LETTER NWIRP BEDFORD MA	FOSTER WHEELER ENVIRONMENTAL CORPORATION	

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N93880.AR.000856	4/25/1997	11	CORRESPONDENCE	LETTER AND U S EPA REGION I COMMENTS REGARDING THE DRAFT FINAL REMEDIAL INVESTIGATION PHASE 2 REPORT NWIRP BEDFORD MA	U S EPA REGION I	SITE 00002, SITE 00003, SITE 00004
N93880.AR.000228	5/7/1997	4	CORRESPONDENCE	LETTER REGARDING U S EPA REGION I REVIEW U S NAVY SELECTION OF MONITORING WELLS NWIRP BEDFORD MA	U S EPA REGION I	
N93880.AR.000229	6/17/1997	56	REPORT	DRAFT RESTORATION ADVISORY BOARD MEETING MINUTES 17 JUNE 1997 NWIRP BEDFORD MA	U S EPA REGION I	
N93880.AR.000853	6/17/1997	5	MINUTES	DRAFT MEETING MINUTES FROM 17 JUNE 1998 RESTORATION ADVISORY BOARD MEETING NWIRP BEDFORD MA	ENSR CONSULTING AND ENGINEERING	
N93880.AR.000231	8/1/1997	30	CORRESPONDENCE	LETTER REGARDING REVISED RESPONSES TO U S EPA REGION I, MADEP AND DONALD COREY COMMENTS ON THE REMEDIAL INVESTIGATION PHASE 2 REPORT NWIRP BEDFORD MA	ENSR CONSULTING AND ENGINEERING	
N93880.AR.000232	8/22/1997	26	CORRESPONDENCE	LETTER AND DRAFT RESPONSES FROM U S NAVY ON COMMENTS FROM U S EPA REGION I, MADEP AND DONALD COREY REGARDING PHASE 2 REMEDIAL INVESTIGATION REPORT NWIRP BEDFORD MA	ENSR CONSULTING AND ENGINEERING	
N93880.AR.000854	9/17/1997	13	MINUTES	DRAFT MEETING MINUTES AND AGENDA FROM 30 SEPTEMBER 1997 RESTORATION ADVISORY BOARD MEETING NWIRP BEDFORD MA	ENSR CONSULTING AND ENGINEERING	
N93880.AR.000234	10/10/1997	7	CORRESPONDENCE	LETTER AND CONCERNS FROM THE U S EPA REGION I REGARDING INVESTIGATIONS AT NWIRP BEDFORD MA	U S EPA REGION I	
N93880.AR.000235	10/17/1997	24	CORRESPONDENCE	LETTER REGARDING U S NAVY RESPONSES TO MADEP REVIEW COMMENTS ON THE PRELIMINARY DRAFT ENVIRONMENTAL BASELINE SURVEY NWIRP BEDFORD MA	COMMONWEALTH OF MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION	
N93880.AR.000237	10/23/1997	4	CORRESPONDENCE	LETTER REGARDING U S EPA REGION I COMMENTS ON FORMER UNDERGROUND STORAGE TANK LOCATIONS ASSESSMENT WORK PLAN NWIRP BEDFORD MA	U S EPA REGION I	
N93880.AR.000233	10/30/1997	94	REPORT	FORMER UNDERGROUND STORAGE TANK LOCATIONS ASSESSMENT WORK PLAN WITH TRANSMITTAL LETTER FOR NWIRP BEDFORD MA	ENSR CONSULTING AND ENGINEERING	
N93880.AR.000238	11/7/1997	3	CORRESPONDENCE	LETTER REGARDING REVISED UNDERGROUND STORAGE TANK WORK PLAN FOR NWIRP BEDFORD MA	U S EPA REGION I	

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N93880.AR.000242	12/4/1997	4	CORRESPONDENCE	LETTER REGARDING REVIEW OF SITE 3 AND SITE 4 EVALUATION WORK PLANS NWIRP BEDFORD MA	U S EPA REGION I	SITE 00003, SITE 00004
N93880.AR.000243	12/17/1997	3	CORRESPONDENCE	LETTER REGARDING RECOMMENDATIONS ON U S EPA REGION I COMMENTS FROM 4 DECEMBER 1997 ON DRAFT WORK PLAN FOR ADDITIONAL INVESTIGATIONS OF SITE 3 AND 4 NWIRP BEDFORD MA	ENSR CONSULTING AND ENGINEERING	SITE 00003, SITE 00004
N93880.AR.000244	1/20/1998	1	PUBLIC NOTICE	NEWSPAPER NOTICE FOR RESTORATION ADVISORY BOARD MEETING 20 JANUARY 1998 NWIRP BEDFORD MA	BEDFORD MINUTEMAN	
N93880.AR.000246	2/4/1998	106	REPORT	FIRST QUARTERLY GROUNDWATER MONITORING REPORT FROM 1 MARCH 1997 THROUGH 1 NOVEMBER 1997 NWIRP BEDFORD MA	FOSTER WHEELER ENVIRONMENTAL CORPORATION	
N93880.AR.000249	2/19/1998	4	CORRESPONDENCE	LETTER AND COMMENTS FROM THE MADEP REGARDING DRAFT FINAL REMEDIAL INVESTIGATION PHASE 2 REPORT PART 2 BASELINE HUMAN HEALTH AND ECOLOGICAL RISK ASSESSMENT NWIRP BEDFORD MA	MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION	
N93880.AR.000250	2/27/1998	20	CORRESPONDENCE	LETTER REGARDING GROUNDWATER DATA RESULTS CONDUCTED FROM 3 NOVEMBER THROUGH 11 NOVEMBER 1997 FOR FIRST QUARTERLY GROUNDWATER MONITORING PROGRAM NWIRP BEDFORD MA	FOSTER WHEELER ENVIRONMENTAL CORPORATION	
N93880.AR.000253	3/10/1998	6	CORRESPONDENCE	LETTER AND RESPONSE TO COMMENTS REGARDING DRAFT WORK PLAN FOR ADDITIONAL INVESTIGATIONS OF SITE 3 AND SITE 4 NWIRP BEDFORD MA	ENSR CONSULTING AND ENGINEERING	SITE 00003, SITE 00004
N93880.AR.000254	3/19/1998	5	CORRESPONDENCE	LETTER AND COMMENTS ON DRAFT SUPPLEMENTAL WORK PLAN FOR SITE 3 AND SITE 4 NWIRP BEDFORD MA	MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION	SITE 00003, SITE 00004
N93880.AR.000255	3/23/1998	3	CORRESPONDENCE	LETTER AND COMMENTS FROM THE U S EPA REGION I REGARDING FIRST QUARTERLY GROUNDWATER MONITORING DATA COLLECTED FROM 3 NOVEMBER TO 11 NOVEMBER 1997 AT NWIRP BEDFORD MA	U S EPA REGION I	
N93880.AR.000256	3/23/1998	10	CORRESPONDENCE	LETTER REGARDING MEMORANDUM OF AGREEMENT CONCERNING IMPLEMENTATION OF GROUNDWATER USE AND VALUE DETERMINATION GUIDANCE NWIRP BEDFORD MA	COMMONWEALTH OF MASSACHUSETTS	

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N93880.AR.000838	4/10/1998	3	CORRESPONDENCE	LETTER AND U S EPA REGION I COMMENTS REGARDING THE REVIEW OF THE FORMER UNDERGROUND STORAGE TANK LOCATIONS ASSESSMENT REPORT NWIRP BEDFORD MA	U S EPA REGION I	
N93880.AR.000258	4/23/1998	12	CORRESPONDENCE	LETTER REGARDING U S NAVY'S RESPONSE TO U S EPA REGION I AND MADEP COMMENTS ON THE DRAFT WORK PLANS FOR SITE 3 AND SITE 4 NWIRP BEDFORD MA	ENSR CONSULTING AND ENGINEERING	SITE 00003, SITE 00004
N93880.AR.000260	5/1/1998	122	REPORT	IMMEDIATE RESPONSE ACTION MONITORING PROGRAM WORK PLAN FOR NWIRP BEDFORD MA	BROWN AND ROOT ENVIRONMENTAL	
N93880.AR.000261	5/1/1998	117	REPORT	WORK PLAN FOR SUPPLEMENTAL INVESTIGATIONS OF SITE 4 BTEX AREA WITH TRANSMITTAL LETTER NWIRP BEDFORD MA	BROWN AND ROOT ENVIRONMENTAL	SITE 00004
N93880.AR.000263	5/1/1998	20	CORRESPONDENCE	LETTER AND ATTACHMENTS REGARDING THE RESULTS OF THE FIRST QUARTERLY GROUNDWATER MONITORING PROGRAM CONDUCTED FROM 2 FEBRUARY 1998 THROUGH 24 FEBRUARY 1998 NWIRP BEDFORD MA	FOSTER WHEELER ENVIRONMENTAL CORPORATION	
N93880.AR.000265	5/11/1998	8	CORRESPONDENCE	LETTER REGARDING MONTHLY OPERATIONS SUMMARY OF GROUNDWATER TREATMENT PLANT AND GROUNDWATER SAMPLING DURING MARCH 1998 NWIRP BEDFORD MA	FOSTER WHEELER ENVIRONMENTAL CORPORATION	
N93880.AR.000266	5/21/1998	4	CORRESPONDENCE	LETTER AND COMMENTS FROM THE U S EPA REGION I REGARDING THE QUARTERLY GROUNDWATER MONITORING DATA COLLECTED AT NWIRP BEDFORD MA	U S EPA REGION I	
N93880.AR.000267	5/22/1998	10	CORRESPONDENCE	LETTER REGARDING MONTHLY OPERATIONS SUMMARY OF GROUNDWATER TREATMENT PLANT AND GROUNDWATER SAMPLING DURING APRIL 1998 NWIRP BEDFORD MA	FOSTER WHEELER ENVIRONMENTAL CORPORATION	
N93880.AR.000241	6/5/1998	116	REPORT	SECOND QUARTERLY GROUNDWATER MONITORING REPORT WITH TRANSMITTAL LETTER NWIRP BEDFORD MA	FOSTER WHEELER ENVIRONMENTAL CORPORATION	
N93880.AR.000269	6/9/1998	2	CORRESPONDENCE	LETTER REGARDING U S EPA REGION I'S CONCERNS WITH THE UNDERGROUND STORAGE TANK ASSESSMENT AND THE INTERFERENCE IMPLICATIONS ON REMEDIAL INVESTIGATION AT NWIRP BEDFORD MA	U S EPA REGION I	
N93880.AR.000270	6/26/1998	4	CORRESPONDENCE	LETTER AND COMMENTS FROM U S EPA REGION I REGARDING IMMEDIATE RESPONSE ACTION MONITORING PROGRAM WORK PLAN NWIRP BEDFORD MA	U S EPA REGION I	

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N93880.AR.000271	6/30/1998	9	CORRESPONDENCE	LETTER REGARDING MONTHLY OPERATIONS SUMMARY OF GROUNDWATER TREATMENT PLANT AND GROUNDWATER SAMPLING DURING MAY 1998 NWIRP BEDFORD MA	FOSTER WHEELER ENVIRONMENTAL CORPORATION	
N93880.AR.000272	7/1/1998	5	CORRESPONDENCE	LETTER REGARDING ACCESS TO PRIVATE PROPERTY WITH RIGHT-OF-ENTRY AGREEMENT NWIRP BEDFORD MA	NAVFAC NORTHERN	
N93880.AR.000273	7/2/1998	3	CORRESPONDENCE	LETTER AND COMMENTS FROM MADEP REGARDING DRAFT IMMEDIATE RESPONSE ACTION MONITORING PROGRAM WORK PLAN NWIRP BEDFORD MA	MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION	
N93880.AR.000274	7/9/1998	28	CORRESPONDENCE	LETTER REGARDING DRAFT RESTORATION ADVISORY BOARD MEETING MINUTES FROM 8 APRIL 1998 NWIRP BEDFORD MA	ENSR CONSULTING AND ENGINEERING	
N93880.AR.000275	7/22/1998	5	CORRESPONDENCE	LETTER AND U S NAVY RESPONSE TO U S EPA REGION I CONCERNS REGARDING THE UNDERGROUND STORAGE TANK ASSESSMENT NWIRP BEDFORD MA	NAVFAC NORTHERN	
N93880.AR.000851	7/22/1998	5	MINUTES	MEETING MINUTES AND AGENDA FROM 22 JULY 1998 RESTORATION ADVISORY BOARD MEETING NWIRP BEDFORD MA	ENSR CONSULTING AND ENGINEERING	
N93880.AR.000277	7/28/1998	2	CORRESPONDENCE	LETTER REGARDING WETLAND AND WETLAND BUFFER ACCESS FOR SUPPLEMENTARY GROUNDWATER FIELD INVESTIGATIONS AT SITE 4 AND THE EXTRACTION WELL AREA NWIRP BEDFORD MA	NAVFAC NORTHERN	SITE 00004
N93880.AR.000278	8/1/1998	307	REPORT	FORMER UNDERGROUND STORAGE TANK LOCATIONS ASSESSMENT WORK PLAN WITH TRANSMITTAL LETTER FOR NWIRP BEDFORD MA	ENSR CONSULTING AND ENGINEERING	
N93880.AR.000280	8/7/1998	9	CORRESPONDENCE	LETTER AND RESPONSE TO U S EPA REGION I AND MADEP COMMENTS REGARDING IMMEDIATE RESPONSE ACTION MONITORING PROGRAM WORK PLAN NWIRP BEDFORD MA	ENSR CONSULTING AND ENGINEERING	
N93880.AR.000281	8/11/1998	2	CORRESPONDENCE	LETTER AND OBSERVATIONS FROM THE U S EPA REGION I AFTER REVIEWING THE U S NAVY'S RESPONSE TO CONCERNS REGARDING THE UNDERGROUND STORAGE TANKS ASSESSMENT NWIRP BEDFORD MA	U S EPA REGION I	
N93880.AR.000252	8/21/1998	68	REPORT	THIRD QUARTER GROUNDWATER MONITORING REPORT NWIRP BEDFORD MA	FOSTER WHEELER ENVIRONMENTAL CORPORATION	

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N93880.AR.000282	8/25/1998	3	CORRESPONDENCE	LETTER AND REVIEW OF U S NAVY'S RESPONSE TO U S EPA REGION I COMMENTS 26 JUNE 1998 REGARDING IMMEDIATE RESPONSE ACTION MONITORING PROGRAM WORK PLAN FOR NWIRP BEDFORD MA	U S EPA REGION I	
N93880.AR.000283	8/25/1998	7	CORRESPONDENCE	LETTER REGARDING MONTHLY OPERATIONS SUMMARY OF GROUNDWATER TREATMENT PLANT AND GROUNDWATER SAMPLING DURING JUNE 1998 NWIRP BEDFORD MA	FOSTER WHEELER ENVIRONMENTAL CORPORATION	
N93880.AR.000284	8/25/1998	8	CORRESPONDENCE	LETTER REGARDING MONTHLY OPERATIONS SUMMARY OF GROUNDWATER TREATMENT PLANT AND GROUNDWATER SAMPLING DURING JULY 1998 NWIRP BEDFORD MA	FOSTER WHEELER ENVIRONMENTAL CORPORATION	
N93880.AR.000285	8/28/1998	5	CORRESPONDENCE	LETTER REGARDING REVIEW OF WORK PLAN FOR SUPPLEMENTAL INVESTIGATIONS OF SITE 3, SOUTHERN FLIGHT TEST AREA AND SITE 4 NWIRP BEDFORD MA	U S EPA REGION I	SITE 00003, SITE 00004
N93880.AR.000286	9/3/1998	3	CORRESPONDENCE	LETTER REGARDING ACCESS TO PRIVATE PROPERTY NWIRP BEDFORD MA	NAVFAC NORTHERN	
N93880.AR.000287	9/14/1998	1	CORRESPONDENCE	LETTER FOLLOW UP FROM U S EPA REGION I LETTER DATED 11 AUGUST 1998 REGARDING CONCERNS ON UNDERGROUND STORAGE TANK LOCATIONS ASSESSMENT REPORT NWIRP BEDFORD MA	NAVFAC NORTHERN	
N93880.AR.000288	10/2/1998	36	CORRESPONDENCE	LETTER REGARDING DRAFT RESTORATION ADVISORY BOARD MEETING MINUTES FOR 22 JULY 1998 NWIRP BEDFORD MA	ENSR CONSULTING AND ENGINEERING	
N93880.AR.000289	10/9/1998	2	CORRESPONDENCE	LETTER REGARDING STATUS OF TASK 6.0 RESPONSE TO COMMENTS ON REMEDIAL INVESTIGATION ISSUES NWIRP BEDFORD MA	ENSR CONSULTING AND ENGINEERING	
N93880.AR.000290	10/9/1998	5	CORRESPONDENCE	MEMORANDUM REGARDING LOCATIONS SELECTED FOR MONITORING WELLS IN BTEX PLUME NWIRP BEDFORD MA	ENSR CONSULTING AND ENGINEERING	
N93880.AR.000291	10/12/1998	9	CORRESPONDENCE	LETTER REGARDING MONTHLY OPERATIONS SUMMARY OF GROUNDWATER TREATMENT PLANT AND GROUNDWATER SAMPLING DURING AUGUST 1998 NWIRP BEDFORD MA	FOSTER WHEELER ENVIRONMENTAL CORPORATION	
N93880.AR.000292	10/15/1998	17	CORRESPONDENCE	LETTER REGARDING REQUEST FOR GROUNDWATER USE AND VALUE DETERMINATION NWIRP BEDFORD MA	COMMONWEALTH OF MASSACHUSETTS	
N93880.AR.000293	10/20/1998	1	CORRESPONDENCE	LETTER REGARDING ACCESS TO PRIVATE PROPERTY NWIRP BEDFORD MA	NAVFAC NORTHERN	

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N93880.AR.000294	10/21/1998	22	CORRESPONDENCE	LETTER REGARDING RESTORATION ADVISORY BOARD MEETING MINUTES AND AGENDA NWIRP BEDFORD MA	NAVFAC NORTHERN	
N93880.AR.000852	10/21/1998	5	MINUTES	DRAFT MEETING MINUTES AND AGENDA FROM 21 OCTOBER 1998 RESTORATION ADVISORY BOARD MEETING NWIRP BEDFORD MA	ENSR CONSULTING AND ENGINEERING	
N93880.AR.000295	10/30/1998	8	CORRESPONDENCE	LETTER REGARDING MONTHLY OPERATIONS SUMMARY OF GROUNDWATER TREATMENT PLANT AND GROUNDWATER SAMPLING DURING SEPTEMBER 1998 NWIRP BEDFORD MA	FOSTER WHEELER ENVIRONMENTAL CORPORATION	
N93880.AR.000355	10/30/1998	8	CORRESPONDENCE	LETTER REGARDING FINAL WORK PLANS FOR ADDITIONAL INVESTIGATIONS OF SITES 3 AND 4 NWIRP BEDFORD MA	ENSR CONSULTING AND ENGINEERING	SITE 00003, SITE 00004
N93880.AR.000296	11/4/1998	4	CORRESPONDENCE	LETTER REGARDING REPLY TO U S EPA REGION I COMMENTS FROM 28 AUGUST 1998 ON FINAL SITE 3 AND SITE 4 SUPPLEMENTAL INVESTIGATION WORK PLANS NWIRP BEDFORD MA	ENSR CONSULTING AND ENGINEERING	SITE 00003, SITE 00004
N93880.AR.000297	11/4/1998	3	CORRESPONDENCE	LETTER REGARDING U S EPA REGION COMMENTS FROM 25 AUGUST 1998 ON U S NAVY'S COMMENTS 7 AUGUST 1998 CONCERNING DRAFT IMMEDIATE RESPONSE ACTION MONITORING PROGRAM WORK PLAN NWIRP BEDFORD MA	ENSR CONSULTING AND ENGINEERING	
N93880.AR.000298	11/12/1998	6	CORRESPONDENCE	LETTER REGARDING AUDIT RESPONSE EVALUATION QUALITY NOTICES STATUS NWIRP BEDFORD MA	TETRA TECH NUS	
N93880.AR.000300	11/24/1998	9	CORRESPONDENCE	LETTER REGARDING MONTHLY OPERATIONS SUMMARY OF GROUNDWATER TREATMENT PLANT AND GROUNDWATER SAMPLING DURING OCTOBER 1998 NWIRP BEDFORD MA	FOSTER WHEELER ENVIRONMENTAL CORPORATION	
N93880.AR.000301	11/30/1998	2	CORRESPONDENCE	LETTER AND REVIEW OF U S NAVY'S RESPONSE TO U S EPA REGION I COMMENTS REGARDING THE IMMEDIATE RESPONSE ACTION MONITORING WORK PLAN FOR NWIRP BEDFORD MA	U S EPA REGION I	
N93880.AR.000303	12/23/1998	1	CORRESPONDENCE	LETTER REGARDING LABORATORY RESULTS FROM THE ADDITIONAL BORINGS FOR FORMER TANK LOCATIONS F-6 AND F-17 AT NWIRP BEDFORD MA	U S EPA REGION I	
N93880.AR.000304	1/4/1999	8	CORRESPONDENCE	LETTER REGARDING MONTHLY OPERATIONS SUMMARY OF GROUNDWATER TREATMENT PLANT AND GROUNDWATER SAMPLING DURING NOVEMBER 1998 NWIRP BEDFORD MA	FOSTER WHEELER ENVIRONMENTAL CORPORATION	

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N93880.AR.000305	1/7/1999	42	CORRESPONDENCE	LETTER REGARDING ADDENDUM TO FORMER UNDERGROUND STORAGE TANK LOCATIONS ASSESSMENT APPENDIX F ADDITIONAL BORINGS AND LABORATORY ANALYSIS NWIRP BEDFORD MA	NAVFAC NORTHERN	
N93880.AR.000306	1/11/1999	2	CORRESPONDENCE	LETTER REGARDING AN EXTENSION TO THE TIME PERIOD TO COMPLETE NEGOTIATION OF A FEDERAL FACILITY AGREEMENT FOR NWIRP BEDFORD MA	U S EPA REGION I	
N93880.AR.000307	1/21/1999	2	CORRESPONDENCE	LETTER REGARDING FEDERAL FACILITY AGREEMENT FOR NATIONAL PRIORITY LIST SITE NWIRP BEDFORD MA	U S EPA REGION I	
N93880.AR.000308	1/29/1999	8	CORRESPONDENCE	LETTER REGARDING MONTHLY OPERATIONS SUMMARY OF GROUNDWATER TREATMENT PLANT AND GROUNDWATER SAMPLING DURING DECEMBER 1998 NWIRP BEDFORD MA	FOSTER WHEELER ENVIRONMENTAL CORPORATION	
N93880.AR.000314	2/1/1999	21	REPORT	TECHNICAL MEMORANDA FOR SITES 3 AND 4 SELECTION OF CLEANUP GOALS AND REMEDIAL ALTERNATIVES WITH TRANSMITTAL LETTER NWIRP BEDFORD MA	ENSR CONSULTING AND ENGINEERING	SITE 00003, SITE 00004
N93880.AR.000315	3/1/1999	8	CORRESPONDENCE	LETTER REGARDING MONTHLY OPERATIONS SUMMARY OF GROUNDWATER TREATMENT PLANT AND GROUNDWATER SAMPLING DURING JANUARY 1999 NWIRP BEDFORD MA	FOSTER WHEELER ENVIRONMENTAL CORPORATION	
N93880.AR.000318	3/31/1999	7	CORRESPONDENCE	LETTER REGARDING REVIEW OF SITE 3 AND SITE 4 TECHNICAL MEMORANDA SELECTION OF CLEANUP GOALS AND REMEDIAL ALTERNATIVES FEASIBILITY STUDY NWIRP BEDFORD MA	U S EPA REGION I	SITE 00003, SITE 00004
N93880.AR.000319	4/2/1999	8	CORRESPONDENCE	LETTER AND ATTACHMENTS REGARDING OPERATIONAL ACTIVITIES PERFORMED DURING THE PERIOD OF 1 FEBRUARY THROUGH 28 FEBRUARY 1999 NWIRP BEDFORD MA	FOSTER WHEELER ENVIRONMENTAL CORPORATION	
N93880.AR.000845	4/7/1999	19	MINUTES	MEETING MINUTES FROM 7 APRIL 1999 RESTORATION ADVISORY BOARD MEETING NWIRP BEDFORD MA	ENSR CONSULTING AND ENGINEERING	
N93880.AR.000855	4/7/1999	5	MINUTES	DRAFT MEETING MINUTES FROM 7 APRIL 1999 RESTORATION ADVISORY BOARD MEETING NWIRP BEDFORD MA	ENSR CONSULTING AND ENGINEERING	
N93880.AR.000320	4/8/1999	4	CORRESPONDENCE	LETTER AND COMMENTS FROM THE MADEP REGARDING THE TECHNICAL MEMORANDA FOR SITE 3 AND SITE 4 DATED 11 FEBRUARY 1999 NWIRP BEDFORD MA	MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION	SITE 00003, SITE 00004

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N93880.AR.000322	4/16/1999	11	CORRESPONDENCE	LETTER AND ATTACHMENTS REGARDING OPERATIONAL ACTIVITIES PERFORMED DURING THE PERIOD OF 1 MARCH 1999 THROUGH 31 MARCH 1999 NWIRP BEDFORD MA	FOSTER WHEELER ENVIRONMENTAL CORPORATION	
N93880.AR.000323	4/23/1999	5	CORRESPONDENCE	LETTER REGARDING REVIEW OF DRAFT SUPPLEMENTAL INVESTIGATION REPORT SITE 4 BTEX AREA NWIRP BEDFORD MA	U S EPA REGION I	SITE 00004
N93880.AR.000324	5/14/1999	1	CORRESPONDENCE	LETTER REGARDING INTERNAL DRAFT FEBRUARY 1999 QUARTERLY IMMEDIATE RESPONSE ACTION MONITORING REPORT NWIRP BEDFORD MA	ENSR CONSULTING AND ENGINEERING	
N93880.AR.000325	5/27/1999	5	CORRESPONDENCE	LETTER AND COMMENTS REGARDING IMMEDIATE RESPONSE ACTION MONITORING REPORT NWIRP BEDFORD MA	U S EPA REGION I	
N93880.AR.000326	5/28/1999	11	CORRESPONDENCE	LETTER REGARDING MONTHLY OPERATIONS SUMMARY OF GROUNDWATER TREATMENT PLANT AND GROUNDWATER SAMPLING DURING APRIL 1999 NWIRP BEDFORD MA	FOSTER WHEELER ENVIRONMENTAL CORPORATION	
N93880.AR.000330	7/2/1999	11	CORRESPONDENCE	LETTER REGARDING MONTHLY OPERATIONS SUMMARY OF GROUNDWATER TREATMENT PLANT AND GROUNDWATER SAMPLING DURING MAY 1999 NWIRP BEDFORD MA	FOSTER WHEELER ENVIRONMENTAL CORPORATION	
N93880.AR.000331	7/7/1999	9	CORRESPONDENCE	LETTER REGARDING U S NAVY RESPONSES TO U S EPA REGION I COMMENTS ON THE DRAFT SUPPLEMENTAL INVESTIGATION REPORT FOR SITE 4 AND SOUTHERN FLIGHT TEST AREA NWIRP BEDFORD MA	ENSR CONSULTING AND ENGINEERING	SITE 00004
N93880.AR.000333	7/19/1999	10	CORRESPONDENCE	LETTER REGARDING RESPONSES TO U S EPA REGION I COMMENTS ON IMMEDIATE RESPONSE ACTION MONITORING REPORT NWIRP BEDFORD MA	ENSR CONSULTING AND ENGINEERING	
N93880.AR.000335	7/20/1999	4	CORRESPONDENCE	LETTER REGARDING REVIEW OF THE FEBRUARY 1999 QUARTERLY MONITORING REPORT IMMEDIATE RESPONSE ACTION NWIRP BEDFORD MA	U S EPA REGION I	
N93880.AR.000336	7/26/1999	11	CORRESPONDENCE	LETTER REGARDING MONTHLY OPERATIONS SUMMARY OF GROUNDWATER TREATMENT PLANT AND GROUNDWATER SAMPLING DURING JUNE 1999 NWIRP BEDFORD MA	FOSTER WHEELER ENVIRONMENTAL CORPORATION	
N93880.AR.000844	8/11/1999	58	MINUTES	DRAFT MEETING MINUTES AND AGENDA FROM 11 AUGUST 1999 RESTORATION ADVISORY BOARD MEETING NWIRP BEDFORD MA	ENSR CONSULTING AND ENGINEERING	

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N93880.AR.000342	8/13/1999	3	CORRESPONDENCE	LETTER REGARDING U S EPA REGION I COMMENTS ON THE DRAFT SUPPLEMENTAL INVESTIGATION REPORT SITE 4 AND SOUTHERN FLIGHT TEST AREA AND DRAFT IMMEDIATE RESPONSE ACTION MONITORING REPORT NWIRP BEDFORD MA	U S EPA REGION I	SITE 00004
N93880.AR.000344	9/1/1999	151	REPORT	MAY 1999 QUARTERLY MONITORING REPORT IMMEDIATE RESPONSE ACTION WITH TRANSMITTAL LETTER NWIRP BEDFORD MA	ENSR CONSULTING AND ENGINEERING	
N93880.AR.000346	9/14/1999	95	REPORT	FEDERAL FACILITY AGREEMENT FOR NATIONAL PRIORITIES LIST SITE WITH TRANSMITTAL LETTER NWIRP BEDFORD MA	U S EPA REGION I	
N93880.AR.000347	9/22/1999	2	CORRESPONDENCE	LETTER REGARDING FEDERAL FACILITY AGREEMENT FOR THE INSTALLATION RESTORATION PROGRAM NWIRP BEDFORD MA	NAVFAC NORTHERN	
N93880.AR.000351	10/4/1999	11	CORRESPONDENCE	LETTER REGARDING MONTHLY OPERATIONS SUMMARY OF GROUNDWATER TREATMENT PLANT AND GROUNDWATER SAMPLING DURING AUGUST 1999 NWIRP BEDFORD MA	FOSTER WHEELER ENVIRONMENTAL CORPORATION	
N93880.AR.000352	10/12/1999	3	CORRESPONDENCE	LETTER REGARDING REVIEW OF MAY 1999 QUARTERLY MONITORING REPORT IMMEDIATE RESPONSE ACTION NWIRP BEDFORD MA	U S EPA REGION I	
N93880.AR.000353	10/21/1999	2	CORRESPONDENCE	LETTER AND RESPONSE TO COMMENTS REGARDING DRAFT FINAL SUPPLEMENTAL INVESTIGATION REPORT SITE 4 BTEX AREA NWIRP BEDFORD MA	ENSR CONSULTING AND ENGINEERING	SITE 00004
N93880.AR.000354	10/22/1999	1	CORRESPONDENCE	MEMORANDUM REGARDING COMMENTS ON SIGNING OF FEDERAL FACILITY AGREEMENT NWIRP BEDFORD MA	U S EPA REGION I	
N93880.AR.000356	11/1/1999	409	REPORT	IMMEDIATE RESPONSE ACTION MONITORING REPORT FOR NWIRP WITH TRANSMITTAL LETTER BEDFORD MA	TETRA TECH NUS	
N93880.AR.000357	11/1/1999	39	REPORT	REMOVAL ACTION EVALUATION SITE 4 NWIRP BEDFORD MA	TETRA TECH NUS	SITE 00004
N93880.AR.000843	11/17/1999	40	MINUTES	MEETING MINUTES AND AGENDA FROM 11 NOVEMBER 1999 RESTORATION ADVISORY BOARD MEETING NWIRP BEDFORD MA	ENSR CONSULTING AND ENGINEERING	
N93880.AR.000363	11/27/1999	3	CORRESPONDENCE	LETTER REGARDING PUBLIC CONCERN ON THE CURRENT AND FUTURE OPERATION OF NWIRP BEDFORD MA	BEDFORD RESIDENT	

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N93880.AR.000364	12/1/1999	210	REPORT	QUARTERLY MONITORING REPORT IMMEDIATE RESPONSE ACTION AUGUST 1999 WITH TRANSMITTAL LETTER NWIRP BEDFORD MA	TETRA TECH NUS	
N93880.AR.000365	12/1/1999	2	CORRESPONDENCE	LETTER REQUESTING THAT THE U S NAVY RE-EVALUATE THE HUMAN HEALTH RISK ASSOCIATED WITH NWIRP BEDFORD MA	U S EPA REGION I	
N93880.AR.000366	12/1/1999	420	REPORT	SUPPLEMENTAL INVESTIGATION REPORT FOR SITE 4 BENZENE, TOLUENE, ETHYL BENZENE AND XYLENE BTEX AREA NWIRP BEDFORD MA	TETRA TECH NUS	SITE 00004
N93880.AR.000367	12/7/1999	11	CORRESPONDENCE	LETTER AND ATTACHMENTS REGARDING OPERATIONAL ACTIVITIES PERFORMED DURING THE PERIOD OF 1 OCTOBER 1999 THROUGH 31 OCTOBER 1999 NWIRP BEDFORD MA	FOSTER WHEELER ENVIRONMENTAL CORPORATION	
N93880.AR.000369	12/8/1999	1	CORRESPONDENCE	LETTER REGARDING REVIEW OF DRAFT FINAL SUPPLEMENTAL INVESTIGATION REPORT SITE 4 NWIRP BEDFORD MA	U S EPA REGION I	SITE 00004
N93880.AR.000371	12/21/1999	9	CORRESPONDENCE	LETTER REGARDING REVISED FIGURES FOR THE SUPPLEMENTAL INVESTIGATION REPORT SITE 4 NWIRP BEDFORD MA	ENSR CONSULTING AND ENGINEERING	SITE 00004
N93880.AR.000372	12/29/1999	2	CORRESPONDENCE	LETTER REGARDING THE U S EPA REGION I REVIEW OF THE DRAFT IMMEDIATE RESPONSE ACTION MONITORING REPORT NWIRP BEDFORD MA	U S EPA REGION I	
N93880.AR.000373	12/29/1999	5	CORRESPONDENCE	LETTER AND COMMENTS FROM THE U S EPA REGION I REGARDING THE AUGUST 1999 QUARTERLY MONITORING REPORT IMMEDIATE RESPONSE ACTION NWIRP BEDFORD MA	U S EPA REGION I	
N93880.AR.000374	1/3/2000	13	CORRESPONDENCE	LETTER AND ATTACHMENTS REGARDING OPERATIONAL ACTIVITIES PERFORMED DURING THE PERIOD OF 1 NOVEMBER 1999 THROUGH 30 NOVEMBER 1999 NWIRP BEDFORD MA	FOSTER WHEELER ENVIRONMENTAL CORPORATION	
N93880.AR.000375	1/10/2000	11	CORRESPONDENCE	LETTER REGARDING MONTHLY OPERATIONS SUMMARY OF GROUNDWATER TREATMENT PLANT AND GROUNDWATER SAMPLING DURING NOVEMBER 1999 NWIRP BEDFORD MA	FOSTER WHEELER ENVIRONMENTAL CORPORATION	
N93880.AR.000377	1/17/2000	12	CORRESPONDENCE	LETTER REGARDING DRAFT RESTORATION ADVISORY BOARD MEETING MINUTES FOR 17 NOVEMBER 1999 NWIRP BEDFORD MA	ENSR CONSULTING AND ENGINEERING	
N93880.AR.000378	1/18/2000	94	CORRESPONDENCE	LETTER WITH ROUND 1 SUPPLEMENTAL PROCESS MONITORING REPORT FOR SITE 4 REMOVAL ACTION NWIRP BEDFORD MA	ENSR CONSULTING AND ENGINEERING	SITE 00004

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N93880.AR.000381	1/22/2000	6	CORRESPONDENCE	LETTER REGARDING ROUND 1 SUPPLEMENTAL PROCESS MONITORING SITE 4 REMOVAL ACTION NWIRP BEDFORD MA	ENSR CONSULTING AND ENGINEERING	SITE 00004
N93880.AR.000384	1/30/2000	12	CORRESPONDENCE	LETTER REGARDING MONTHLY OPERATIONS SUMMARY OF GROUNDWATER TREATMENT PLANT AND GROUNDWATER SAMPLING DURING DECEMBER 1999 NWIRP BEDFORD MA	FOSTER WHEELER ENVIRONMENTAL CORPORATION	
N93880.AR.000385	2/1/2000	5	CORRESPONDENCE	LETTER AND COMMENTS FROM THE U S EPA REGION I ON THE DRAFT REMOVAL ACTION EVALUATION SITE 4 NWIRP BEDFORD MA	U S EPA REGION I	SITE 00004
N93880.AR.000386	2/1/2000	1	CORRESPONDENCE	LETTER REGARDING THE FEDERAL FACILITY AGREEMENT NATIONAL PRIORITIES LIST SITE TO INCLUDE NWIRP BEDFORD MA	U S EPA REGION I	
N93880.AR.000387	2/7/2000	7	CORRESPONDENCE	LETTER REGARDING ROUND 2 SUPPLEMENTAL PROCESS MONITORING SITE 4 REMOVAL ACTION NWIRP BEDFORD MA	ENSR CONSULTING AND ENGINEERING	SITE 00004
N93880.AR.000390	2/28/2000	12	CORRESPONDENCE	LETTER REGARDING THE DATA VALIDATION AND ANALYTICAL DATA FOR WELLS ON THE MURPHY PROPERTY NWIRP BEDFORD MA	ENSR CONSULTING AND ENGINEERING	
N93880.AR.000391	2/28/2000	8	CORRESPONDENCE	LETTER AND RESPONSE TO U S EPA REGION I COMMENTS REGARDING DRAFT REMOVAL ACTION EVALUATION REPORT SITE 4 NWIRP BEDFORD MA	ENSR CONSULTING AND ENGINEERING	SITE 00004
N93880.AR.000850	3/1/2000	36	MINUTES	MEETING MINUTES AND AGENDA FROM 1 MARCH 2000 RESTORATION ADVISORY BOARD MEETING NWIRP BEDFORD MA	ENSR CONSULTING AND ENGINEERING	
N93880.AR.000400	4/4/2000	2	CORRESPONDENCE	LETTER AND REVIEW OF U S NAVY'S RESPONSE TO U S EPA REGION I COMMENTS REGARDING THE DRAFT REMOVAL ACTION EVALUATION REPORT NWIRP BEDFORD MA	U S EPA REGION I	SITE 00004
N93880.AR.000401	4/5/2000	7	CORRESPONDENCE	LETTER REGARDING DRAFT BASELINE SURVEY WORK PLAN SITE 4 REMOVAL ACTION NWIRP BEDFORD MA	ENSR CONSULTING AND ENGINEERING	SITE 00004
N93880.AR.000402	4/11/2000	4	CORRESPONDENCE	LETTER REGARDING COMMENTS ON DRAFT FEASIBILITY STUDY REPORT SITE 4 NWIRP BEDFORD MA	COMMONWEALTH OF MASSACHUSETTS	SITE 00004
N93880.AR.000403	4/12/2000	3	CORRESPONDENCE	LETTER AND COMMENTS FROM U S EPA REGION I REGARDING NOVEMBER 1999 QUARTERLY MONITORING REPORT IMMEDIATE RESPONSE ACTION NWIRP BEDFORD MA	U S EPA REGION I	

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N93880.AR.000404	4/25/2000	9	CORRESPONDENCE	LETTER AND COMMENTS FROM U S EPA REGION I REGARDING DRAFT ACTION MEMORANDUM SITE 4 BTEX AREA NWIRP BEDFORD MA	U S EPA REGION I	SITE 00004
N93880.AR.000405	5/1/2000	11	CORRESPONDENCE	LETTER REGARDING MONTHLY OPERATIONS SUMMARY OF GROUNDWATER TREATMENT PLANT AND GROUNDWATER SAMPLING DURING MARCH 2000 NWIRP BEDFORD MA	FOSTER WHEELER ENVIRONMENTAL CORPORATION	
N93880.AR.000406	5/2/2000	2	CORRESPONDENCE	LETTER AND COMMENTS FROM U S EPA REGION I REGARDING DRAFT BASELINE SURVEY WORK PLAN SITE 4 BTEX AREA NWIRP BEDFORD MA	U S EPA REGION I	SITE 00004
N93880.AR.000407	5/3/2000	39	CORRESPONDENCE	LETTER REGARDING DRAFT RESTORATION BOARD MEETING MINUTES FOR 1 MARCH 2000 NWIRP BEDFORD MA	ENSR CONSULTING AND ENGINEERING	
N93880.AR.000409	5/23/2000	4	CORRESPONDENCE	LETTER WITH U S NAVY RESPONSES TO U S EPA REGION I COMMENTS 4 APRIL 2000 ON DRAFT REMOVAL ACTION EVALUATION REPORT FOR SITE 4 NWIRP BEDFORD MA	ENSR CONSULTING AND ENGINEERING	SITE 00004
N93880.AR.000410	5/23/2000	4	CORRESPONDENCE	LETTER AND RESPONSE TO U S EPA REGION I COMMENTS REGARDING WELL INVENTORY TABLE NWIRP BEDFORD MA	ENSR CONSULTING AND ENGINEERING	
N93880.AR.000412	6/2/2000	11	CORRESPONDENCE	LETTER REGARDING MONTHLY OPERATIONS SUMMARY OF GROUNDWATER TREATMENT PLANT AND GROUNDWATER SAMPLING DURING APRIL 2000 NWIRP BEDFORD MA	FOSTER WHEELER ENVIRONMENTAL CORPORATION	
N93880.AR.000413	6/7/2000	3	CORRESPONDENCE	MEETING MINUTES FROM 7 JUNE 2000 MANAGEMENT MEETING TO DISCUSS RESPONSES TO BOTH U S EPA REGION I AND MADEP COMMENTS ON SITE 4 FEASIBILITY STUDY NWIRP BEDFORD MA	ENSR CONSULTING AND ENGINEERING	SITE 00004
N93880.AR.000414	6/8/2000	7	CORRESPONDENCE	LETTER WITH U S NAVY RESPONSE TO U S EPA REGION I COMMENTS 25 APRIL 2000 ON DRAFT ACTION MEMORANDUM FOR SITE 4 BTEX AREA NWIRP BEDFORD MA	ENSR CONSULTING AND ENGINEERING	SITE 00004
N93880.AR.000416	6/16/2000	4	CORRESPONDENCE	LETTER AND RESPONSE TO U S EPA REGION I COMMENTS ON THE DRAFT BASELINE SURVEY WORK PLAN SITE 4 NWIRP BEDFORD MA	ENSR CONSULTING AND ENGINEERING	SITE 00004
N93880.AR.000419	6/20/2000	2	CORRESPONDENCE	LETTER REGARDING REVIEW OF U S NAVY'S RESPONSES TO U S EPA REGION I COMMENTS ON WELL INVENTORY TABLE AND SITE 4 NWIRP BEDFORD MA	U S EPA REGION I	SITE 00004

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N93880.AR.000425	7/12/2000	154	REPORT	DRAFT BASELINE SURVEY REPORT SITE 4 REMOVAL ACTION WITH TRANSMITTAL LETTER NWIRP BEDFORD MA	ENSR CONSULTING AND ENGINEERING	SITE 00004
N93880.AR.000427	7/18/2000	24	CORRESPONDENCE	LETTER REGARDING RESPONSE TO U S EPA REGION I COMMENTS 14 MAY 2000 ON THE DRAFT FEASIBILITY STUDY SITE 4 NWIRP BEDFORD MA	ENSR CONSULTING AND ENGINEERING	SITE 00004
N93880.AR.000429	7/19/2000	1	PUBLIC NOTICE	NEWSPAPER NOTICE FOR RESTORATION ADVISORY BOARD MEETING 19 JULY 2000 NWIRP BEDFORD MA	LEXINGTON MINUTEMAN AND BEDFORD MINUTEMAN	
N93880.AR.000849	7/19/2000	46	MINUTES	MEETING MINUTES AND AGENDA FROM 19 JULY 2000 RESTORATION ADVISORY BOARD MEETING NWIRP BEDFORD MA	ENSR CONSULTING AND ENGINEERING	
N93880.AR.000431	7/24/2000	4	CORRESPONDENCE	LETTER WITH U S EPA REGION I COMMENTS ON THE REVIEW OF THE NINTH ROUND OF QUARTERLY MONITORING REPORT FOR IMMEDIATE RESPONSE ACTION NWIRP BEDFORD MA	U S EPA REGION I	
N93880.AR.000432	7/25/2000	6	CORRESPONDENCE	LETTER WITH U S NAVY RESPONSES TO U S EPA REGION I COMMENTS ON THE DRAFT FINAL REMEDIAL INVESTIGATION PHASE 2 REPORT NWIRP BEDFORD MA	ENSR CONSULTING AND ENGINEERING	
N93880.AR.000433	7/28/2000	11	CORRESPONDENCE	LETTER REGARDING MONTHLY OPERATIONS SUMMARY OF GROUNDWATER TREATMENT PLANT AND GROUNDWATER SAMPLING DURING JUNE 2000 NWIRP BEDFORD MA	FOSTER WHEELER ENVIRONMENTAL CORPORATION	
N93880.AR.000435	8/14/2000	3	CORRESPONDENCE	LETTER AND COMMENTS FROM THE U S EPA REGION I REGARDING THE DRAFT BASELINE SURVEY SITE 4 REMOVAL ACTION NWIRP BEDFORD MA	U S EPA REGION I	SITE 00004
N93880.AR.000438	8/17/2000	8	CORRESPONDENCE	LETTER REGARDING U S NAVY'S RESPONSE TO U S EPA REGION I COMMENTS ON THE DRAFT FEASIBILITY STUDY SITE 4 NWIRP BEDFORD MA	U S EPA REGION I	SITE 00004
N93880.AR.000439	8/28/2000	11	CORRESPONDENCE	LETTER REGARDING MONTHLY OPERATIONS SUMMARY OF GROUNDWATER TREATMENT PLANT AND GROUNDWATER SAMPLING DURING JULY 2000 NWIRP BEDFORD MA	FOSTER WHEELER ENVIRONMENTAL CORPORATION	
N93880.AR.000441	8/30/2000	4	CORRESPONDENCE	LETTER AND COMMENTS FROM THE MADEP REGARDING THE DRAFT BASELINE SURVEY REPORT SITE 4 REMOVAL ACTION NWIRP BEDFORD MA	MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION	SITE 00004

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N93880.AR.000442	9/1/2000	448	REPORT	REMEDIAL INVESTIGATION PHASE 2 REPORT PART 1 FIELD INVESTIGATION RESULTS VOLUME 1 OF 3 NWIRP BEDFORD MA	TETRA TECH NUS	
N93880.AR.000443	9/1/2000	884	REPORT	REMEDIAL INVESTIGATION PHASE 2 REPORT PART 1 FIELD INVESTIGATION RESULTS VOLUME 2 OF 3 NWIRP BEDFORD MA	TETRA TECH NUS	
N93880.AR.000444	9/1/2000	641	REPORT	REMEDIAL INVESTIGATION PHASE 2 REPORT PART 1 FIELD INVESTIGATION RESULTS VOLUME 3 OF 3 NWIRP BEDFORD MA	TETRA TECH NUS	
N93880.AR.000445	9/1/2000	273	REPORT	REMEDIAL INVESTIGATION PHASE 2 REPORT PART 2 BASELINE HUMAN HEALTH AND ECOLOGICAL RISK ASSESSMENT VOLUME 1 OF 2 NWIRP BEDFORD MA	TETRA TECH NUS	
N93880.AR.000446	9/1/2000	1056	REPORT	REMEDIAL INVESTIGATION PHASE 2 REPORT PART 2 BASELINE HUMAN HEALTH AND ECOLOGICAL RISK ASSESSMENT VOLUME 2 OF 2 NWIRP BEDFORD MA	TETRA TECH NUS	
N93880.AR.000451	9/20/2000	35	REPORT	INJECTION WORK PLAN GEO-CLEANSE TREATMENT PROGRAM NWIRP BEDFORD MA	GEO-CLEANSE INTERNATIONAL	
N93880.AR.000455	9/21/2000	2	CORRESPONDENCE	MEETING MINUTES FROM MANAGEMENT MEETING HELD 21 SEPTEMBER 2000 TO DISCUSS U S EPA REGION I COMMENTS ON THE SITE 4 DRAFT FEASIBILITY STUDY NWIRP BEDFORD MA	ENSR CONSULTING AND ENGINEERING	
N93880.AR.000456	9/25/2000	6	CORRESPONDENCE	LETTER AND RESPONSE TO U S EPA REGION I COMMENTS REGARDING DRAFT FEBRUARY 2000 QUARTERLY MONITORING REPORT IMMEDIATE RESPONSE ACTION NWIRP BEDFORD MA	ENSR CONSULTING AND ENGINEERING	
N93880.AR.000803	9/26/2000	49	CORRESPONDENCE	LETTER REGARDING DRAFT RESTORATION ADVISORY BOARD MEETING MINUTES FOR 19 JULY 2000 NWIRP BEDFORD MA	ENSR CONSULTING AND ENGINEERING	
N93880.AR.000810	10/1/2000	37	REPORT	ACTION MEMORANDUM FOR SITE 4 WITH TRANSMITTAL LETTER NWIRP BEDFORD MA	ENSR CONSULTING AND ENGINEERING	SITE 00004
N93880.AR.000460	10/12/2000	19	CORRESPONDENCE	LETTER AND RESPONSE TO U S EPA REGION I LETTER DATED 14 JULY 2000 REGARDING DRAFT SITE MANAGEMENT PLAN NWIRP BEDFORD MA	ENSR CONSULTING AND ENGINEERING	
N93880.AR.000461	10/16/2000	3	CORRESPONDENCE	LETTER AND REVIEW OF THE U S NAVY'S RESPONSE TO U S EPA REGION I COMMENTS REGARDING FEBRUARY 2000 QUARTERLY MONITORING REPORT NWIRP BEDFORD MA	U S EPA REGION I	

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N93880.AR.000462	10/18/2000	16	MINUTES	MEETING MINUTES FOR RESTORATION ADVISORY BOARD HELD 18 OCTOBER 2000 NWIRP BEDFORD MA	U S NAVY	
N93880.AR.000463	10/18/2000	18	CORRESPONDENCE	LETTER REGARDING ORIGIN OF DRUMS FOUND NEAR THE ANTENNA RANGE BUILDING NWIRP BEDFORD MA	RAYTHEON	
N93880.AR.000464	10/18/2000	1	PUBLIC NOTICE	NEWSPAPER NOTICE FOR RESTORATION ADVISORY BOARD MEETING 18 OCTOBER 2000 NWIRP BEDFORD MA	LEXINGTON MINUTEMAN AND BEDFORD MINUTEMAN	
N93880.AR.000465	10/19/2000	38	REPORT	CHEMICAL OXIDATION INJECTION WORK PLAN SITE 4 WITH TRANSMITTAL LETTER NWIRP BEDFORD MA	GEO-CLEANSE INTERNATIONAL	SITE 00004
N93880.AR.000833	10/19/2000	3	CORRESPONDENCE	LETTER REGARDING U S EPA REGION I COMMENTS ON DRAFT AMENDMENT TO SITE MANAGEMENT PLAN NWIRP BEDFORD MA	U S EPA REGION I	
N93880.AR.000468	11/1/2000	26	REPORT	REMOVAL ACTION IMPLEMENTATION WORK PLAN FOR SITE 4 WITH U S NAVY RESPONSES TO U S EPA REGION I COMMENTS FROM 22 OCTOBER 2000 AND MADEP COMMENTS AND TRANSMITTAL LETTER NWIRP BEDFORD MA	ENSR CONSULTING AND ENGINEERING	SITE 00004
N93880.AR.000473	11/16/2000	2	PUBLIC NOTICE	NEWSPAPER NOTICE FOR AVAILABILITY OF SITE 4 ACTION MEMORANDUM LEGAL NOTICE NWIRP BEDFORD MA	LEXINGTON MINUTEMAN AND BEDFORD MINUTEMAN	SITE 00004
N93880.AR.000475	11/17/2000	9	CORRESPONDENCE	LETTER AND COMMENTS FROM U S EPA REGION I REGARDING DRAFT FINAL FEASIBILITY STUDY SITE 4 NWIRP BEDFORD MA	ENSR CONSULTING AND ENGINEERING	SITE 00004
N93880.AR.000811	11/22/2000	4	CORRESPONDENCE	LETTER REGARDING FINAL REMOVAL ACTION IMPLEMENTATION WORK PLAN AND RESPONSES TO U S EPA COMMENTS OF 22 OCTOBER 2000 ON DRAFT REMOVAL ACTION IMPLEMENTATION WORK PLAN NWIRP BEDFORD MA	ENSR CONSULTING AND ENGINEERING	
N93880.AR.000476	11/28/2000	13	CORRESPONDENCE	LETTER REGARDING MONTHLY OPERATIONS SUMMARY OF GROUNDWATER TREATMENT PLANT AND GROUNDWATER SAMPLING DURING OCTOBER 2000 NWIRP BEDFORD MA	FOSTER WHEELER ENVIRONMENTAL CORPORATION	
N93880.AR.000481	12/18/2000	2	CORRESPONDENCE	LETTER REGARDING MEMORANDUM OF UNDERSTANDING NWIRP BEDFORD MA	U S EPA REGION I	
N93880.AR.000482	12/19/2000	46	CORRESPONDENCE	LETTER REGARDING DRAFT RESTORATION ADVISORY BOARD MEETING MINUTES FOR 18 OCTOBER 2000 NWIRP BEDFORD MA	ENSR CONSULTING AND ENGINEERING	

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N93880.AR.000483	12/20/2000	6	CORRESPONDENCE	LETTER AND COMMENTS FROM THE U S EPA REGION I REGARDING THE DRAFT FINAL FEASIBILITY STUDY SITE 4 NWIRP BEDFORD MA	U S EPA REGION I	SITE 00004
N93880.AR.000484	12/20/2000	20	CORRESPONDENCE	LETTER REGARDING REVISIONS TO PROPOSED APPLICABLE OR RELEVANT AND APPROPRIATE REQUIREMENTS TABLES FOR DRAFT FINAL FEASIBILITY STUDY REPORT SITE 4 NWIRP BEDFORD MA	U S EPA REGION I	SITE 00004
N93880.AR.000486	1/4/2001	3	CORRESPONDENCE	LETTER AND COMMENTS FROM MADEP REGARDING THE DRAFT FINAL FEASIBILITY STUDY SITE 4 NWIRP BEDFORD MA	MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION	SITE 00004
N93880.AR.000488	1/7/2001	2	CORRESPONDENCE	LETTER FROM U S EPA REGION I REGARDING THE NEW SCHEDULES FOR SITES 3 AND 4 PROPOSED PLANS NWIRP BEDFORD MA	U S EPA REGION I	SITE 00003, SITE 00004
N93880.AR.000489	1/8/2001	3	CORRESPONDENCE	LETTER AND COMMENTS FROM THE U S EPA REGION I REGARDING THE AUGUST 2000 QUARTERLY MONITORING REPORT IMMEDIATE RESPONSE ACTION NWIRP BEDFORD MA	U S EPA REGION I	
N93880.AR.000491	1/22/2001	7	CORRESPONDENCE	MEMORANDUM REGARDING USE OF MASSACHUSETTS CONTINGENCY PLAN METHOD 1 GW-1 STANDARDS AS APPLICABLE OR RELEVANT AND APPROPRIATE REQUIREMENTS NWIRP BEDFORD MA	ENSR CONSULTING AND ENGINEERING	
N93880.AR.000494	1/31/2001	1	CORRESPONDENCE	AGENDA FOR RESTORATION ADVISORY BOARD MEETING 31 JANUARY 2001 NWIRP BEDFORD MA	U S NAVY	
N93880.AR.000495	1/31/2001	1	PUBLIC NOTICE	NEWSPAPER NOTICE FOR RESTORATION ADVISORY BOARD MEETING 31 JANUARY 2001 NWIRP BEDFORD MA	LEXINGTON MINUTEMAN AND BEDFORD MINUTEMAN	
N93880.AR.000848	1/31/2001	15	MINUTES	MEETING MINUTES AND AGENDA FROM 31 JANUARY 2001 RESTORATION ADVISORY BOARD MEETING NWIRP BEDFORD MA	ENSR CONSULTING AND ENGINEERING	
N93880.AR.000498	2/1/2001	3	CORRESPONDENCE	LETTER AND U S NAVY RESPONSE TO MADEP COMMENTS REGARDING SITE 4 FEASIBILITY STUDY NWIRP BEDFORD MA	NAVFAC NORTHERN	SITE 00004
N93880.AR.000499	2/5/2001	27	CORRESPONDENCE	LETTER WITH ANALYTICAL SUMMARY DATA FROM ROUND 2 SUPPLEMENTAL PROCESS MONITORING REPORT FOR SITE 4 REMOVAL ACTION NWIRP BEDFORD MA	ENSR CONSULTING AND ENGINEERING	SITE 00004

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N93880.AR.000500	2/6/2001	11	CORRESPONDENCE	MEMORANDUM REGARDING USE OF MASSACHUSETTS CONTINGENCY PLAN METHOD 1 GW-1 STANDARDS AS APPLICABLE OR RELEVANT AND APPROPRIATE REQUIREMENTS NWIRP BEDFORD MA	ENSR CONSULTING AND ENGINEERING	
N93880.AR.000501	2/9/2001	2	CORRESPONDENCE	MEMORANDUM REGARDING REQUEST FOR LEGAL ADVICE FOR USE OF MASSACHUSETTS CONTINGENCY PLAN METHOD 1 GROUNDWATER 1 STANDARDS AS APPLICABLE OR RELEVANT AND APPROPRIATE REQUIREMENTS NWIRP BEDFORD MA	NAVFAC NORTHERN	SITE 00004
N93880.AR.000503	2/22/2001	92	CORRESPONDENCE	LETTER WITH ROUND 1 PERFORMANCE MONITORING REPORT FOR SITE 4 REMOVAL ACTION NWIRP BEDFORD MA	ENSR CONSULTING AND ENGINEERING	SITE 00004
N93880.AR.000504	3/1/2001	220	REPORT	FINAL FEASIBILITY STUDY REPORT SITE 4 WITH TRANSMITTAL LETTER NWIRP BEDFORD MA	ENSR CONSULTING AND ENGINEERING	SITE 00004
N93880.AR.000505	3/5/2001	7	CORRESPONDENCE	LETTER REGARDING DRAFT PRELIMINARY ANALYTICAL DATA ROUND 2 PERFORMANCE MONITORING REPORT SITE 4 REMOVAL ACTION NWIRP BEDFORD MA	ENSR CONSULTING AND ENGINEERING	SITE 00004
N93880.AR.000507	3/19/2001	14	CORRESPONDENCE	LETTER REGARDING INTERNAL FINAL SITE 4 FEASIBILITY STUDY NWIRP BEDFORD MA	ENSR CONSULTING AND ENGINEERING	SITE 00004
N93880.AR.000508	3/22/2001	6	CORRESPONDENCE	LETTER AND RESPONSE TO COMMENTS ON THE DRAFT FINAL FEASIBILITY STUDY SITE 4 NWIRP BEDFORD MA	ENSR CONSULTING AND ENGINEERING	SITE 00004
N93880.AR.000510	4/10/2001	64	CORRESPONDENCE	LETTER AND ATTACHMENT REGARDING ROUND 2 PERFORMANCE MONITORING REPORT AND TREATMENT STATUS REPORT SITE 4 NWIRP BEDFORD MA	ENSR CONSULTING AND ENGINEERING	SITE 00004
N93880.AR.000511	4/16/2001	2	CORRESPONDENCE	LETTER REGARDING MASSACHUSETTS CONTINGENCY PLAN REGARDING METHOD GW-1 STANDARDS NWIRP BEDFORD MA	U S EPA REGION I	
N93880.AR.000807	4/17/2001	1	CORRESPONDENCE	LETTER REGARDING REQUEST FOR EXTENSION OF FORMAL DISPUTE DEADLINE OF 22 APRIL 2001 MASSACHUSETTS CONTINGENCY PLAN METHOD 1 NWIRP BEDFORD MA	U S EPA REGION I	
N93880.AR.000804	4/18/2001	8	CORRESPONDENCE	LETTER REGARDING AGENDA FOR RESTORATION ADVISORY BOARD MEETING 2 MAY 2001 AND DRAFT RESTORATION ADVISORY BOARD MEETING MINUTES FOR 31 JANUARY 2001 NWIRP BEDFORD MA	ENSR CONSULTING AND ENGINEERING	

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N93880.AR.000512	4/23/2001	2	CORRESPONDENCE	LETTER REGARDING EXTENSION CONCURRENCE OF FORMAL DISPUTE DEADLINE FOR MASSACHUSETTS CONTINGENCY PLAN NWIRP BEDFORD MA	NAVFAC NORTHERN	SITE 00004
N93880.AR.000513	4/24/2001	2	CORRESPONDENCE	MEMORANDUM REGARDING FOUR POTENTIAL OUTSTANDING TASKS NWIRP BEDFORD MA	ENSR CONSULTING AND ENGINEERING	
N93880.AR.000514	4/25/2001	13	CORRESPONDENCE	LETTER OF TRANSMITTAL REGARDING LEGAL NOTICES FOR SEVERAL ACTIONS NWIRP BEDFORD MA	ENSR CONSULTING AND ENGINEERING	
N93880.AR.000516	5/1/2001	4	CORRESPONDENCE	MEETING MINUTES FROM MANAGERS MEETING FROM 1 MAY 2001 TO SITE 4 REMOVAL ACTION AND FEASIBILITY STUDY ACTIVITIES NWIRP BEDFORD MA	ENSR CONSULTING AND ENGINEERING	
N93880.AR.000517	5/2/2001	1	PUBLIC NOTICE	NEWSPAPER NOTICE FOR RESTORATION ADVISORY BOARD MEETING 2 MAY 2001 NWIRP BEDFORD MA	LEXINGTON MINUTEMAN AND BEDFORD MINUTEMAN	
N93880.AR.000847	5/2/2001	12	MINUTES	MEETING MINUTES AND AGENDA FROM 2 MAY 2001 RESTORATION ADVISORY BOARD MEETING NWIRP BEDFORD MA	ENSR CONSULTING AND ENGINEERING	
N93880.AR.000518	5/3/2001	4	CORRESPONDENCE	LETTER REGARDING RESPONSE TO THE U S EPA REGION I 16 APRIL 2001 LETTER REGARDING THE MASSACHUSETTS CONTINGENCY PLAN NWIRP BEDFORD MA	NAVFAC NORTHERN	
N93880.AR.000519	5/5/2001	21	CORRESPONDENCE	LETTER REGARDING ROUND 2 PERFORMANCE MONITORING REPORT AND TREATMENT STATUS REPORT FOR SITE 4 SOURCE AREA REMOVAL ACTION NWIRP BEDFORD MA	U S EPA REGION I	SITE 00004
N93880.AR.000520	5/11/2001	2	CORRESPONDENCE	LETTER REGARDING DRAFT PERFORMANCE WORK STATEMENT AND ENGINEER'S COST ESTIMATE NWIRP BEDFORD MA	MALCOLM PIRNIE	
N93880.AR.000521	5/14/2001	1	PUBLIC NOTICE	NEWSPAPER ARTICLE REGARDING NOTICE FOR 14 MAY 2002 RESTORATION ADVISORY BOARD MEETING NWIRP BEDFORD MA	LEXINGTON MINUTEMAN	
N93880.AR.000522	5/14/2001	1	PUBLIC NOTICE	NEWSPAPER ARTICLE REGARDING NOTICE FOR 14 MAY 2002 RESTORATION ADVISORY BOARD MEETING NWIRP BEDFORD MA	BEDFORD MINUTEMAN	
N93880.AR.000523	5/17/2001	9	CORRESPONDENCE	MEMORANDUM REGARDING REVISED DATA TABLES FOR ROUND 2 PERFORMANCE MONITORING REPORT NWIRP BEDFORD MA	ENSR CONSULTING AND ENGINEERING	
N93880.AR.000524	5/17/2001	3	CORRESPONDENCE	MEMORANDUM SUMMARIZING ADDENDUM FOR RESIDENTIAL USE OF GROUNDWATER NWIRP BEDFORD MA	ENSR CONSULTING AND ENGINEERING	SITE 00003, SITE 00004

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N93880.AR.000525	5/22/2001	2	CORRESPONDENCE	LETTER REGARDING RISK ASSESSMENT APPROACH FOR GROUNDWATER AT SITES 3 AND 4 NWIRP BEDFORD MA	ENSR CONSULTING AND ENGINEERING	SITE 00003, SITE 00004
N93880.AR.000526	5/22/2001	3	CORRESPONDENCE	LETTER AND COMMENTS REGARDING ROUND 2 PERFORMANCE MONITORING REPORT AND TREATMENT STATUS REPORT SITE 4 SOURCE AREA REMOVAL ACTION NWIRP BEDFORD MA	MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION	SITE 00004
N93880.AR.000527	5/23/2001	4	CORRESPONDENCE	LETTER AND COMMENTS FROM U S EPA REGION I REGARDING ROUND 2 PERFORMANCE MONITORING REPORT FOR SITE 4 SOURCE AREA REMOVAL ACTION NWIRP BEDFORD MA	ENSR CONSULTING AND ENGINEERING	SITE 00004
N93880.AR.000528	5/23/2001	3	CORRESPONDENCE	MEMORANDUM SUMMARIZING PROPOSED APPROACH TO THE GROUNDWATER RISK ASSESSMENT FOR SITES 3 AND 4 NWIRP BEDFORD MA	ENSR CONSULTING AND ENGINEERING	SITE 00003, SITE 00004
N93880.AR.000529	5/30/2001	13	CORRESPONDENCE	LETTER REGARDING DRAFT RESTORATION ADVISORY BOARD MEETING MINUTES FOR 2 MAY 2001 NWIRP BEDFORD MA	ENSR CONSULTING AND ENGINEERING	
N93880.AR.000530	6/1/2001	4	CORRESPONDENCE	LETTER AND U S NAVY RESPONSES TO U S EPA REGION I COMMENTS REGARDING ROUND 2 PERFORMANCE MONITORING REPORT SITE 4 SOURCE AREA REMOVAL ACTION NWIRP BEDFORD MA	ENSR CONSULTING AND ENGINEERING	SITE 00004
N93880.AR.000531	6/6/2001	6	CORRESPONDENCE	LETTER AND U S NAVY RESPONSES TO MADEP COMMENTS 22 MAY 2001 ON THE ROUND 2 PERFORMANCE MONITORING REPORT SITE 4 SUBMITTED ON 10 APRIL 2001 NWIRP BEDFORD MA	ENSR CONSULTING AND ENGINEERING	SITE 00004
N93880.AR.000532	7/1/2001	21	REPORT	DRAFT HAZARDOUS WASTE MANAGEMENT PLAN NWIRP BEDFORD MA	TETRA TECH NUS	
N93880.AR.000533	7/2/2001	3	CORRESPONDENCE	MEMORANDUM REGARDING THE PRE-POLISH TREATMENT FIELD PARAMETER MONITORING CONDUCTED 7 AND 8 JUNE 2001 NWIRP BEDFORD MA	ENSR CONSULTING AND ENGINEERING	SITE 00004
N93880.AR.000537	8/7/2001	9	CORRESPONDENCE	LETTER REGARDING MONTHLY OPERATIONS SUMMARY OF GROUNDWATER TREATMENT PLANT AND GROUNDWATER SAMPLING DURING MAY 2001 NWIRP BEDFORD MA	FOSTER WHEELER ENVIRONMENTAL CORPORATION	
N93880.AR.000539	8/16/2001	49	CORRESPONDENCE	LETTER REGARDING ANALYTICAL DATA VALIDATION OF VOLATILE ORGANIC COMPOUNDS IN NWIRP BEDFORD MA	ENSR CONSULTING AND ENGINEERING	

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N93880.AR.000540	8/24/2001	13	CORRESPONDENCE	LETTER REGARDING MONTHLY OPERATIONS SUMMARY OF GROUNDWATER TREATMENT PLANT AND GROUNDWATER SAMPLING DURING JUNE 2001 NWIRP BEDFORD MA	FOSTER WHEELER ENVIRONMENTAL CORPORATION	
N93880.AR.000541	8/27/2001	36	CORRESPONDENCE	AGENDA FOR RESTORATION ADVISORY BOARD MEETING 12 SEPTEMBER 2001 AND DRAFT RESTORATION ADVISORY BOARD MEETING MINUTES 2 MAY 2001 NWIRP BEDFORD MA	ENSR CONSULTING AND ENGINEERING	
N93880.AR.000542	9/1/2001	150	REPORT	FINAL PERFORMANCE WORK STATEMENT LONG TERM OPERATION AND MAINTENANCE OF REMEDIAL SYSTEMS WITH TRANSMITTAL LETTER NWIRP BEDFORD MA	MALCOLM PIRNIE	
N93880.AR.000543	9/1/2001	12	CORRESPONDENCE	NEWSLETTER TO INFORM THE PUBLIC REGARDING PROPOSED CLEAN UP PLAN FOR SITE 4 NWIRP BEDFORD MA	NAVFAC NORTHEAST	SITE 00004
N93880.AR.000549	9/6/2001	5	CORRESPONDENCE	LETTER REGARDING DRAFT ADDENDUM TO SITE 4 FEASIBILITY STUDY CHANGE PAGES FOR DRAFT FINAL 3 FEASIBILITY STUDY AND RISK ASSESSMENT ADDENDUM NWIRP BEDFORD MA	U S EPA REGION I	SITE 00003, SITE 00004
N93880.AR.000551	9/11/2001	9	CORRESPONDENCE	LETTER REGARDING PROJECT MANAGER'S MEETING AGENDA WITH DISCUSSION POINTS NWIRP BEDFORD MA	ENSR CONSULTING AND ENGINEERING	
N93880.AR.000552	9/12/2001	1	PUBLIC NOTICE	NEWSPAPER NOTICE FOR RESTORATION ADVISORY BOARD MEETING 12 SEPTEMBER 2001 MEETING WAS CANCELLED DUE TO EVENTS THAT OCCURRED ON 11 SEPTEMBER 2001 NWIRP BEDFORD MA	LEXINGTON MINUTEMAN AND BEDFORD MINUTEMAN	
N93880.AR.000822	9/13/2001	110	ANALYTICAL DATA	LETTER REGARDING 30 DAY POST POLISH TREATMENT DATA SITE 4 REMOVAL ACTION NWIRP MA	ENSR CONSULTING AND ENGINEERING	SITE 00004
N93880.AR.000554	9/25/2001	3	CORRESPONDENCE	LETTER WITH U S NAVY RESPONSES TO U S EPA REGION I AND MADEP COMMENTS ON THE DRAFT SITE 4 ADDENDUM TO THE FEASIBILITY STUDY NWIRP BEDFORD MA	ENSR CONSULTING AND ENGINEERING	SITE 00004
N93880.AR.000556	10/1/2001	21	CORRESPONDENCE	LETTER WITH CHANGE PAGES FOR FEASIBILITY STUDY ADDENDUM FOR SITES 3 AND 4 NWIRP BEDFORD MA	ENSR CONSULTING AND ENGINEERING	SITE 00003, SITE 00004
N93880.AR.000557	10/1/2001	50	REPORT	ADDENDUM TO THE SITE 4 FEASIBILITY STUDY WITH TRANSMITTAL LETTER NWIRP BEDFORD MA	TETRA TECH NUS	SITE 00004
N93880.AR.000563	10/4/2001	14	CORRESPONDENCE	LETTER REGARDING SUBMITTAL OF DRAFT FINAL SITE 4 PROPOSED PLAN AND RESPONSE TO U S EPA REGION I COMMENTS NWIRP BEDFORD MA	ENSR CONSULTING AND ENGINEERING	SITE 00004

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N93880.AR.000564	10/10/2001	1	CORRESPONDENCE	LETTER REGARDING U S EPA REGION I CONCURRENCE ON FEASIBILITY STUDY FOR SITES 3 AND 4 NWIRP BEDFORD MA	U S EPA REGION I	SITE 00003, SITE 00004
N93880.AR.000568	10/22/2001	2	CORRESPONDENCE	LETTER FROM U S EPA REGION I REGARDING THE RESOLUTION OF COMMENTS IN LETTER DATED 14 SEPTEMBER 2001 FOR DRAFT FINAL PROPOSED PLAN SITE 4 NWIRP BEDFORD MA	U S EPA REGION I	SITE 00004
N93880.AR.000569	10/29/2001	13	CORRESPONDENCE	LETTER REGARDING MONTHLY OPERATIONS SUMMARY OF GROUNDWATER TREATMENT PLANT AND GROUNDWATER SAMPLING DURING SEPTEMBER 2001 NWIRP BEDFORD MA	FOSTER WHEELER ENVIRONMENTAL CORPORATION	
N93880.AR.000570	10/31/2001	112	REPORT	SUMMARY OF THE PERFORMANCE MONITORING FOR THE SECOND PHASE OF TREATMENT OF THE SITE 4 SOURCE REMOVAL ACTION WITH TRANSMITTAL LETTER NWIRP BEDFORD MA	ENSR CONSULTING AND ENGINEERING	SITE 00004
N93880.AR.000571	11/1/2001	18	REPORT	MONITORED NATURAL ATTENUATION ASSESSMENT WORK PLAN SITE 4 WITH TRANSMITTAL LETTER NWIRP BEDFORD MA	TETRA TECH NUS	SITE 00004
N93880.AR.000572	11/7/2001	1	CORRESPONDENCE	LETTER AND COMMENTS REGARDING THE DRAFT MONITORED NATURAL ATTENUATION ASSESSMENT WORK PLAN FOR SITE 4 NWIRP BEDFORD MA	MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION	SITE 00004
N93880.AR.000574	12/5/2001	1	PUBLIC NOTICE	NEWSPAPER NOTICE FOR RESTORATION ADVISORY BOARD MEETING 5 DECEMBER 2001 NWIRP BEDFORD MA	LEXINGTON MINUTEMAN AND BEDFORD MINUTEMAN	
N93880.AR.000846	12/5/2001	18	MINUTES	MEETING MINUTES AND AGENDA FROM 5 DECEMBER 2001 RESTORATION ADVISORY BOARD MEETING NWIRP BEDFORD MA	ENSR CONSULTING AND ENGINEERING	
N93880.AR.000577	12/11/2001	3	CORRESPONDENCE	LETTER AND U S NAVY RESPONSES TO U S EPA REGION I AND MADEP COMMENTS ON PROPOSED PLAN FOR SITE 4 NWIRP BEDFORD MA	ENSR CONSULTING AND ENGINEERING	SITE 00004
N93880.AR.000578	12/11/2001	3	CORRESPONDENCE	LETTER REQUESTING A SCHEDULE EXTENSION FOR SITE 4 PROPOSED PLAN AND RECORD OF DECISION FOR NWIRP BEDFORD MA	ENSR CONSULTING AND ENGINEERING	SITE 00004
N93880.AR.000579	12/12/2001	2	PUBLIC NOTICE	NEWSPAPER NOTICE REGARDING "NAVY SEEKS CLEANUP SOLUTIONS" NWIRP BEDFORD MA	TOWNONLINECOMMUNITY.COM	
N93880.AR.000584	1/22/2002	13	CORRESPONDENCE	LETTER REGARDING MONTHLY OPERATIONS SUMMARY OF GROUNDWATER TREATMENT PLANT AND GROUNDWATER SAMPLING DURING NOVEMBER 2001 NWIRP BEDFORD MA	FOSTER WHEELER ENVIRONMENTAL CORPORATION	

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N93880.AR.000590	2/25/2002	13	CORRESPONDENCE	LETTER REGARDING MONTHLY OPERATIONS SUMMARY OF GROUNDWATER TREATMENT PLANT AND GROUNDWATER SAMPLING DURING DECEMBER 2001 NWIRP BEDFORD MA	FOSTER WHEELER ENVIRONMENTAL CORPORATION	
N93880.AR.000591	2/26/2002	14	CORRESPONDENCE	LETTER REGARDING MONTHLY OPERATIONS SUMMARY OF GROUNDWATER TREATMENT PLANT AND GROUNDWATER SAMPLING DURING JANUARY 2002 NWIRP BEDFORD MA	FOSTER WHEELER ENVIRONMENTAL CORPORATION	
N93880.AR.000595	4/4/2002	1	CORRESPONDENCE	LETTER REGARDING PUBLIC DRAFT PROPOSED PLAN FOR SITE 4 NWIRP BEDFORD MA	U S EPA REGION I	SITE 00004
N93880.AR.000596	4/4/2002	5	CORRESPONDENCE	LETTER REGARDING ACCESS AGREEMENT TO SAMPLE GROUNDWATER QUALITY AND PERFORM A METES AND BOUND SURVEY NWIRP BEDFORD MA	EFA NORTHEAST	
N93880.AR.000597	4/10/2002	2	CORRESPONDENCE	LETTER FROM THE MADEP REQUESTING THE PROPOSED PLAN SITE 4 BE EDITED NWIRP BEDFORD MA	MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION	SITE 00004
N93880.AR.000598	4/10/2002	2	CORRESPONDENCE	LETTER REGARDING PROPOSED PLAN FOR SITE 4 APRIL 2000 FROM MADEP NWIRP BEDFORD MA	COMMONWEALTH OF MASSACHUSETTS	SITE 00004
N93880.AR.000599	4/11/2002	8	CORRESPONDENCE	MEMORANDUM REGARDING THE RELOCATION OF OFF PROPERTY MONITORING WELLS NWIRP BEDFORD MA	ENSR CONSULTING AND ENGINEERING	
N93880.AR.000601	4/23/2002	31	REPORT	REVISED APPENDIX A FOR FINAL FEASIBILITY STUDY REPORT SITE 4 WITH TRANSMITTAL LETTER NWIRP BEDFORD MA	ENSR CONSULTING AND ENGINEERING	SITE 00004
N93880.AR.000605	4/30/2002	5	CORRESPONDENCE	LETTER WITH DRAFT RESTORATION ADVISORY BOARD MEETING MINUTES FROM 5 DECEMBER 2001 MEETING NWIRP BEDFORD MA	ENSR CONSULTING AND ENGINEERING	
N93880.AR.000607	5/1/2002	12	PUBLIC NOTICE	PROPOSED CLEAN UP PLAN FOR SITE 4 NWIRP BEDFORD MA	U S DEPARTMENT OF THE NAVY	SITE 00004
N93880.AR.000608	5/5/2002	591	REPORT	THERMAL TREATMENT PILOT TEST AND REMEDIATION QUALITY ASSURANCE QUALITY CONTROL PLAN SITES 3 AND 4 WITH TRANSMITTAL LETTER NWIRP BEDFORD MA	FOSTER WHEELER ENVIRONMENTAL CORPORATION	SITE 00003, SITE 00004
N93880.AR.000609	5/14/2002	1	MINUTES	AGENDA FOR PUBLIC MEETING TO BE HELD ON 14 MAY 2002 AT THE BEDFORD TOWN HALL ON SITE 4 PROPOSED PLAN AND RESTORATION ADVISORY BOARD MEETING NWIRP BEDFORD MA	ENSR CONSULTING AND ENGINEERING	SITE 00004
N93880.AR.000610	5/14/2002	5	CORRESPONDENCE	PUBLIC HEARING MINUTES REGARDING PROPOSED PLAN OPERABLE UNIT 4 SITE 4 NWIRP BEDFORD MA	CATUOGNO COURT REPORTING SERVICES	SITE 00004

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N93880.AR.000611	5/14/2002	1	PUBLIC NOTICE	NEWSPAPER NOTICE FOR PUBLIC INFORMATION SESSION, PUBLIC HEARING AND RESTORATION ADVISORY BOARD MEETING 14 MAY 2001 NWIRP BEDFORD MA	LEXINGTON MINUTEMAN AND BEDFORD MINUTEMAN	
N93880.AR.000801	5/16/2002	1	CORRESPONDENCE	E-MAIL FOLLOW UP ON DROPPING THE ISCO PILOT AT SITE 3 NWIRP BEDFORD MA	U S EPA REGION I	
N93880.AR.000802	5/22/2002	1	CORRESPONDENCE	E-MAIL TO CONFIRM DEPARTMENT OF ENVIRONMENTAL PROTECTION DECISION TO CONDUCT ONLY ONE PILOT TEST USING THERMAL TREATMENT NWIRP BEDFORD MA	MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION	
N93880.AR.000613	5/31/2002	2	CORRESPONDENCE	PUBLIC COMMENTS REGARDING SITE 4 REMEDIAL ACTION DECISION NWIRP BEDFORD MA	BEDFORD RESIDENT	
N93880.AR.000616	7/8/2002	8	CORRESPONDENCE	LETTER AND U S EPA REGION I COMMENTS REGARDING DRAFT RECORD OF DECISION FOR SITE 4 NWIRP BEDFORD MA	U S EPA REGION I	SITE 00004
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N93880.AR.000625	8/1/2002	203	REPORT	TECHNICAL PROPOSAL FOR IN-SITU THERMAL TREATMENT PILOT TEST NWIRP BEDFORD MA	FOSTER WHEELER ENVIRONMENTAL CORPORATION	
N93880.AR.000626	8/2/2002	250	REPORT	TECHNICAL AND MANAGEMENT PROPOSAL THERMAL TREATMENT PILOT TEST VOLUME 2 AT NWIRP BEDFORD MA	CURRENT ENVIRONMENTAL SOLUTIONS	
N93880.AR.000627	8/7/2002	112	REPORT	THERMAL TREATMENT PILOT TEST AT NWIRP BEDFORD MA	THERMAL REMEDIATION SERVICES, INC.	
N93880.AR.000628	8/26/2002	13	CORRESPONDENCE	LETTER REGARDING MONTHLY OPERATIONS SUMMARY OF GROUNDWATER TREATMENT PLANT AND GROUNDWATER SAMPLING DURING JUNE 2002 NWIRP BEDFORD MA	FOSTER WHEELER ENVIRONMENTAL CORPORATION	
N93880.AR.000629	9/5/2002	13	CORRESPONDENCE	LETTER REGARDING MONTHLY OPERATIONS SUMMARY OF GROUNDWATER TREATMENT PLANT AND GROUNDWATER SAMPLING DURING JULY 2002 NWIRP BEDFORD MA	FOSTER WHEELER ENVIRONMENTAL CORPORATION	
N93880.AR.000630	10/8/2002	13	CORRESPONDENCE	LETTER REGARDING MONTHLY OPERATIONS SUMMARY OF GROUNDWATER TREATMENT PLANT AND GROUNDWATER SAMPLING DURING AUGUST 2002 NWIRP BEDFORD MA	FOSTER WHEELER ENVIRONMENTAL CORPORATION	
N93880.AR.000631	10/16/2002	1	PUBLIC NOTICE	NEWSPAPER NOTICE FOR RESTORATION ADVISORY BOARD MEETING 16 OCTOBER 2002 NWIRP BEDFORD MA	LEXINGTON MINUTEMAN	

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N93880.AR.000632	10/23/2002	2	CORRESPONDENCE	NEWSPAPER ARTICLE IN THE LEXINGTON MINUTEMAN REGARDING NOTICE FOR 16 OCTOBER 2002 RESTORATION ADVISORY BOARD MEETING NWIRP BEDFORD MA	ENSR CONSULTING AND ENGINEERING	
N93880.AR.000638	12/6/2002	115	REPORT	DRAFT WORK PLAN FOR THERMAL TREATMENT PILOT TEST WITH TRANSMITTAL LETTER NWIRP BEDFORD MA	FOSTER WHEELER ENVIRONMENTAL CORPORATION	
N93880.AR.000580	12/17/2002	28	MINUTES	LETTER REGARDING DRAFT RESTORATION ADVISORY BOARD MEETING MINUTES FOR 16 OCTOBER 2002 NWIRP BEDFORD MA	ENSR CONSULTING AND ENGINEERING	
N93880.AR.000647	2/3/2003	1	CORRESPONDENCE	LETTER REGARDING ELECTRICAL RESISTANCE HEATING REMEDIAL ACTION AT SITE 4 NWIRP BEDFORD MA	U S EPA REGION I	SITE 00004
N93880.AR.000648	2/21/2003	17	CORRESPONDENCE	LETTER REGARDING MONTHLY OPERATIONS SUMMARY OF GROUNDWATER TREATMENT PLANT AND GROUNDWATER SAMPLING DURING NOVEMBER 2002 NWIRP BEDFORD MA	ENVIRONMENTAL CHEMICAL CORPORATION	
N93880.AR.000649	2/26/2003	18	CORRESPONDENCE	LETTER REGARDING MONTHLY OPERATIONS SUMMARY OF GROUNDWATER TREATMENT PLANT AND GROUNDWATER SAMPLING DURING DECEMBER 2002 NWIRP BEDFORD MA	ENVIRONMENTAL CHEMICAL CORPORATION	
N93880.AR.000651	3/5/2003	1	PUBLIC NOTICE	NEWSPAPER NOTICE FOR RESTORATION ADVISORY BOARD MEETING 5 MARCH 2003 NWIRP BEDFORD MA	LEXINGTON MINUTEMAN AND BEDFORD MINUTEMAN	
N93880.AR.000652	3/14/2003	17	CORRESPONDENCE	LETTER REGARDING MONTHLY OPERATIONS SUMMARY OF GROUNDWATER TREATMENT PLANT AND GROUNDWATER SAMPLING DURING JANUARY 2003 NWIRP BEDFORD MA	ENVIRONMENTAL CHEMICAL CORPORATION	
N93880.AR.000650	3/27/2003	565	REPORT	DRAFT SITE 4 REMOVAL ACTION SUMMARY REPORT WITH TRANSMITTAL LETTER NWIRP BEDFORD MA	ENSR CONSULTING AND ENGINEERING	SITE 00004
N93880.AR.000653	3/27/2003	108	REPORT	DRAFT 150 DAY PERFORMANCE MONITORING AND TREATMENT STATUS REPORT SITE 4 SOURCE AREA REMOVAL ACTION WITH TRANSMITTAL LETTER NWIRP BEDFORD MA	ENSR CONSULTING AND ENGINEERING	SITE 00004
N93880.AR.000654	3/31/2003	124	REPORT	DATA SUMMARY REPORT WELL RELOCATION WITH TRANSMITTAL LETTER NWIRP BEDFORD MA	ENSR CONSULTING AND ENGINEERING	
N93880.AR.000656	4/7/2003	17	CORRESPONDENCE	LETTER REGARDING MONTHLY OPERATIONS SUMMARY OF GROUNDWATER TREATMENT PLANT AND GROUNDWATER SAMPLING DURING FEBRUARY 2003 NWIRP BEDFORD MA	ENVIRONMENTAL CHEMICAL CORPORATION	

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N93880.AR.000659	4/28/2003	200	REPORT	THERMAL TREATMENT PILOT TEST AND REMEDIATION QUALITY ASSURANCE/QUALITY CONTROL PLAN WITH TRANSMITTAL LETTER NWIRP BEDFORD MA	FOSTER WHEELER ENVIRONMENTAL CORPORATION	
N93880.AR.000792	5/8/2003	2	CORRESPONDENCE	ANNOTATED RESPONSES TO U S EPA REGION REVIEW COMMENTS NWIRP BEDFORD MA	FOSTER WHEELER ENVIRONMENTAL CORPORATION	
N93880.AR.000793	5/12/2003	1	CORRESPONDENCE	E-MAIL DRAFT COMMENTS ON THE DRAFT QUALITY ASSURANCE PROJECT PLAN NWIRP BEDFORD MA	MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION	
N93880.AR.000794	5/13/2003	1	CORRESPONDENCE	LETTER REGARDING DRAFT QUALITY ASSURANCE PROJECT PLAN FOR THERMAL TREATMENT PILOT TEST NWIRP BEDFORD MA	U S EPA REGION I	
N93880.AR.000662	5/14/2003	129	ANALYTICAL DATA	SAMPLING DATA FROM SITE 4 THERMAL TREATMENT MONITORING WELL INSTALLATION SOIL SAMPLING 14-17 MAY 2003 AND 26 JUNE 2003, BASELINE GROUNDWATER SAMPLING 29 MAY-2 JUNE 2003, 30 JUNE 2003 AND 9 SEPTEMBER 2003 NWIRP BEDFORD MA	ENSR CONSULTING AND ENGINEERING	SITE 00004
N93880.AR.000663	5/19/2003	4	CORRESPONDENCE	LETTER AND RESPONSE REGARDING REVIEW COMMENTS ON DRAFT WORK PLAN FOR SITE 3, FINAL SITE 3 PILOT STUDY WORK PLAN, AND DRAFT WORK PLAN FOR SITE 4 THERMAL TREATMENT NWIRP BEDFORD MA	MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION	SITE 00003, SITE 00004
N93880.AR.000664	5/22/2003	54	REPORT	HEALTH AND SAFETY PLAN ENVIRONMENTAL ACTIVITIES OVERSIGHT TO SUPPORT THERMAL ELECTRICAL RESISTANCE HEATING PILOT TEST AT SITE 3 AND THERMAL ELECTRICAL RESISTANCE HEATING TREATMENT AT SITE 4 NWIRP BEDFORD MA	ENSR CONSULTING AND ENGINEERING	SITE 00003, SITE 00004
N93880.AR.000795	5/29/2003	4	CORRESPONDENCE	LETTER INCLUDING COMMENTS TO DRAFT QUALITY ASSURANCE PROJECT PLAN FOR THERMAL TREATMENT PILOT TEST NWIRP BEDFORD MA	U S EPA REGION I	
N93880.AR.000671	7/2/2003	17	CORRESPONDENCE	LETTER REGARDING MONTHLY OPERATIONS SUMMARY OF GROUNDWATER TREATMENT PLANT AND GROUNDWATER SAMPLING DURING MARCH 2003 NWIRP BEDFORD MA	ENVIRONMENTAL CHEMICAL CORPORATION	
N93880.AR.000672	7/2/2003	17	CORRESPONDENCE	LETTER REGARDING MONTHLY OPERATIONS SUMMARY OF GROUNDWATER TREATMENT PLANT AND GROUNDWATER SAMPLING DURING APRIL 2003 NWIRP BEDFORD MA	ENVIRONMENTAL CHEMICAL CORPORATION	

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N93880.AR.000673	7/8/2003	17	CORRESPONDENCE	LETTER REGARDING MONTHLY OPERATIONS SUMMARY OF GROUNDWATER TREATMENT PLANT AND GROUNDWATER SAMPLING DURING MAY 2003 NWIRP BEDFORD MA	ENVIRONMENTAL CHEMICAL CORPORATION	
N93880.AR.000674	7/9/2003	17	CORRESPONDENCE	LETTER REGARDING MONTHLY OPERATIONS SUMMARY OF GROUNDWATER TREATMENT PLANT AND GROUNDWATER SAMPLING DURING JUNE 2003 NWIRP BEDFORD MA	ENVIRONMENTAL CHEMICAL CORPORATION	
N93880.AR.000675	7/10/2003	597	REPORT	THERMAL TREATMENT PILOT TEST AND REMEDIATION QUALITY ASSURANCE QUALITY CONTROL PLAN WITH TRANSMITTAL LETTER NWIRP BEDFORD MA	FOSTER WHEELER ENVIRONMENTAL CORPORATION	
N93880.AR.000676	7/16/2003	1	PUBLIC NOTICE	NEWSPAPER NOTICE FOR RESTORATION ADVISORY BOARD MEETING 29 OCTOBER 2003 NWIRP BEDFORD MA	LEXINGTON MINUTEMAN AND BEDFORD MINUTEMAN	
N93880.AR.000678	8/12/2003	17	CORRESPONDENCE	LETTER REGARDING MONTHLY OPERATIONS SUMMARY OF GROUNDWATER TREATMENT PLANT AND GROUNDWATER SAMPLING DURING JULY 2003 NWIRP BEDFORD MA	ENVIRONMENTAL CHEMICAL CORPORATION	
N93880.AR.000679	8/27/2003	61	MINUTES	MINUTES FROM 16 JULY 2003 RESTORATION ADVISORY BOARD MEETING NWIRP BEDFORD MA	ENSR CONSULTING AND ENGINEERING	
N93880.AR.000796	9/2/2003	2	CORRESPONDENCE	LETTER REGARDING COMMENTS TO DRAFT QUALITY ASSURANCE PROJECT PLAN FOR THERMAL TREATMENT PILOT TEST NWIRP BEDFORD MA	U S EPA REGION I	
N93880.AR.000682	9/19/2003	17	CORRESPONDENCE	LETTER REGARDING MONTHLY OPERATIONS SUMMARY OF GROUNDWATER TREATMENT PLANT AND GROUNDWATER SAMPLING DURING AUGUST 2003 NWIRP BEDFORD MA	ENVIRONMENTAL CHEMICAL CORPORATION	
N93880.AR.000684	10/10/2003	17	CORRESPONDENCE	LETTER REGARDING MONTHLY OPERATIONS SUMMARY OF GROUNDWATER TREATMENT PLANT AND GROUNDWATER SAMPLING DURING SEPTEMBER 2003 NWIRP BEDFORD MA	ENVIRONMENTAL CHEMICAL CORPORATION	
N93880.AR.000685	10/10/2003	17	CORRESPONDENCE	LETTER REGARDING MONTHLY OPERATIONS SUMMARY OF GROUNDWATER TREATMENT PLANT AND GROUNDWATER SAMPLING DURING OCTOBER 2003 NWIRP BEDFORD MA	ENVIRONMENTAL CHEMICAL CORPORATION	
N93880.AR.000687	10/29/2003	1	PUBLIC NOTICE	NEWSPAPER NOTICE FOR RESTORATION ADVISORY BOARD MEETING 29 OCTOBER 2003 NWIRP BEDFORD MA	LEXINGTON MINUTEMAN AND BEDFORD MINUTEMAN	

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N93880.AR.000798	11/20/2003	2	CORRESPONDENCE	LETTER WITH COMMENTS TO DRAFT THERMAL TREATMENT PILOT TEST QUALITY ASSURANCE QUALITY CONTROL PLAN ADDENDUM NUMBER 1 NWIRP BEDFORD MA	U S EPA REGION I	
N93880.AR.000691	12/15/2003	17	CORRESPONDENCE	LETTER REGARDING MONTHLY OPERATIONS SUMMARY OF GROUNDWATER TREATMENT PLANT AND GROUNDWATER SAMPLING DURING NOVEMBER 2003 NWIRP BEDFORD MA	ENVIRONMENTAL CHEMICAL CORPORATION	
N93880.AR.000692	12/16/2003	1	CORRESPONDENCE	LETTER REGARDING SITE 4 DRAFT ACTION MEMORANDUM TO CONTINUE RESPONSE ACTION OCTOBER 2003 NWIRP BEDFORD MA	MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION	SITE 00004
N93880.AR.000799	12/17/2003	2	CORRESPONDENCE	LETTER WITH COMMENTS TO DRAFT THERMAL TREATMENT PILOT TEST QUALITY ASSURANCE QUALITY CONTROL PLAN ADDENDUM NUMBER 1 NWIRP BEDFORD MA	U S EPA REGION I	
N93880.AR.000693	12/23/2003	102	REPORT	FINAL WORK PLAN FOR SITE 4 THERMAL TREATMENT NWIRP BEDFORD MA	TETRA TECH NUS	SITE 00004
N93880.AR.000694	1/6/2004	3	CORRESPONDENCE	LETTER REGARDING DRAFT SITE MANAGEMENT PLAN OCTOBER 2003 NWIRP BEDFORD MA	COMMONWEALTH OF MASSACHUSETTS	
N93880.AR.000695	1/15/2004	17	CORRESPONDENCE	LETTER REGARDING MONTHLY OPERATIONS SUMMARY OF GROUNDWATER TREATMENT PLANT AND GROUNDWATER SAMPLING DURING DECEMBER 2003 NWIRP BEDFORD MA	ENVIRONMENTAL CHEMICAL CORPORATION	
N93880.AR.000696	1/26/2004	2	CORRESPONDENCE	LETTER REGARDING THE PROPOSED DRAFT WORK PLAN FOR INVESTIGATING POTENTIAL SOURCES OF RELEASE BENEATH THE COMPONENTS LABORATORY AT NWIRP BEDFORD MA	MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION	
N93880.AR.000697	1/28/2004	1	PUBLIC NOTICE	NEWSPAPER NOTICE FOR RESTORATION ADVISORY BOARD MEETING 28 JANUARY 2004 MEETING WAS CANCELLED DUE TO BAD WEATHER NEXT MEETING 3 MARCH 2004 NWIRP BEDFORD MA	LEXINGTON MINUTEMAN AND BEDFORD MINUTEMAN	
N93880.AR.000698	1/29/2004	1	CORRESPONDENCE	LETTER AND COMMENTS REGARDING DRAFT ACTION MEMORANDUM TO CONTINUE RESPONSE ACTIONS SITE 4 NWIRP BEDFORD MA	U S EPA REGION I	SITE 00004

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N93880.AR.000800	2/2/2004	4	CORRESPONDENCE	LETTER REGARDING RESPONSE TO U S EPA REGION I COMMENTS OF 20 NOVEMBER 2003 ON THE U S NAVY DRAFT THERMAL TREATMENT PILOT TEST QUALITY ASSURANCE QUALITY CONTROL PLAN ADDENDUM NUMBER 1 NWIRP BEDFORD MA	NAVFAC NORTHERN	
N93880.AR.000703	2/9/2004	1	PUBLIC NOTICE	NEWSPAPER NOTICE FOR AVAILABILITY OF SITE 4 ACTION MEMORANDUM LEGAL NOTICE NWIRP BEDFORD MA	LEXINGTON MINUTEMAN AND BEDFORD MINUTEMAN	SITE 00004
N93880.AR.000706	3/3/2004	23	MINUTES	MINUTES FROM 3 MARCH 2004 RESTORATION ADVISORY BOARD MEETING NWIRP BEDFORD MA	U S NAVY	
N93880.AR.000707	3/3/2004	1	PUBLIC NOTICE	NEWSPAPER NOTICE FOR RESTORATION ADVISORY BOARD MEETING 3 MARCH 2004 NWIRP BEDFORD MA	LEXINGTON MINUTEMAN AND BEDFORD MINUTEMAN	
N93880.AR.000708	3/11/2004	150	REPORT	DRAFT WORK PLAN FOR ADDITIONAL MONITORING WELLS AT SITE 3 WITH TRANSMITTAL LETTER NWIRP BEDFORD MA	ENSR CONSULTING AND ENGINEERING	SITE 00003
N93880.AR.000709	3/17/2004	17	CORRESPONDENCE	LETTER REGARDING MONTHLY OPERATIONS SUMMARY OF GROUNDWATER TREATMENT PLANT AND GROUNDWATER SAMPLING DURING FEBRUARY 2004 NWIRP BEDFORD MA	ENVIRONMENTAL CHEMICAL CORPORATION	
N93880.AR.000710	4/6/2004	17	CORRESPONDENCE	LETTER REGARDING MONTHLY OPERATIONS SUMMARY OF GROUNDWATER TREATMENT PLANT AND GROUNDWATER SAMPLING DURING MARCH 2004 NWIRP BEDFORD MA	ENVIRONMENTAL CHEMICAL CORPORATION	
N93880.AR.000711	4/16/2004	26	CORRESPONDENCE	LETTER REGARDING RESTORATION ADVISORY BOARD MEETING MINUTES FOR 3 MARCH 2004 AND MEETING AGENDA FOR 16 JUNE 2004 RESTORATION ADVISORY BOARD MEETING NWIRP BEDFORD MA	ENSR CONSULTING AND ENGINEERING	
N93880.AR.000712	5/5/2004	2	CORRESPONDENCE	LETTER AND MAP REGARDING PROPOSED MONITORING WELL SAMPLING LOCATIONS FOR SITE 4 MONITORED NATURAL ATTENUATION SAMPLING NWIRP BEDFORD MA	ENSR CONSULTING AND ENGINEERING	SITE 00004
N93880.AR.000713	5/6/2004	41	REPORT	ACTION MEMORANDUM FOR SITE 4 WITH TRANSMITTAL LETTER NWIRP BEDFORD MA	TETRA TECH NUS	SITE 00004
N93880.AR.000715	5/7/2004	16	CORRESPONDENCE	LETTER REGARDING MONTHLY OPERATIONS SUMMARY OF GROUNDWATER TREATMENT PLANT AND GROUNDWATER SAMPLING DURING APRIL 2004 NWIRP BEDFORD MA	ENVIRONMENTAL CHEMICAL CORPORATION	

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N93880.AR.000718	6/2/2004	3	CORRESPONDENCE	LETTER AND RESPONSES TO MADEP COMMENTS ON DRAFT FINAL WORK PLAN FOR THE COMPONENTS LABORATORY INVESTIGATION IN SUPPORT OF CONSTRUCTABILITY EVALUATION FOR FULL SCALE IMPLEMENTATION OF ELECTRICAL RESISTANCE HEATING THERMAL TREATMENT NWIRP BEDFORD MA	TETRA TECH FW	SITE 00003, SITE 00004
N93880.AR.000719	6/16/2004	7	MINUTES	MINUTES AND AGENDA FOR THE RESTORATION ADVISORY BOARD MEETING HELD 16 JUNE 2004 NWIRP BEDFORD MA	NAVFAC NORTHERN	
N93880.AR.000731	8/1/2004	4	CORRESPONDENCE	FACT SHEET REGARDING SITE 4 AT NWIRP BEDFORD MA	U S NAVY	SITE 00004
N93880.AR.000734	8/25/2004	26	CORRESPONDENCE	LETTER REGARDING RESTORATION ADVISORY BOARD MEETING MINUTES FOR 16 JUNE 2004 AND AGENDA FOR 22 SEPTEMBER 2005 RESTORATION ADVISORY BOARD MEETING MINUTES AND SEPTEMBER 2004 FACT SHEET NWIRP BEDFORD MA	ENSR CONSULTING AND ENGINEERING	
N93880.AR.000735	9/1/2004	301	REPORT	DRAFT MONITORED NATURAL ATTENUATION ASSESSMENT FOR SITE 4 WITH TRANSMITTAL LETTER NWIRP BEDFORD MA	TETRA TECH NUS	SITE 00004
N93880.AR.000736	9/1/2004	302	REPORT	DRAFT MONITORED NATURAL ATTENUATION ASSESSMENT FOR SITE 4 APPENDICES WITH TRANSMITTAL LETTER NWIRP BEDFORD MA	TETRA TECH NUS	SITE 00004
N93880.AR.000737	9/21/2004	8	CORRESPONDENCE	TECHNICAL REVIEW COMMITTEE MEETING MINUTES AND DRAFT AGENDA FOR 21 SEPTEMBER 2004 NWIRP BEDFORD MA	U S NAVY	
N93880.AR.000738	9/22/2004	22	CORRESPONDENCE	AGENDA FOR RESTORATION ADVISORY BOARD MEETING HELD 22 SEPTEMBER 2004 NWIRP BEDFORD MA	U S NAVY	
N93880.AR.000739	9/22/2004	1	PUBLIC NOTICE	NEWSPAPER NOTICE FOR RESTORATION ADVISORY BOARD MEETING 22 SEPTEMBER 2004 NWIRP BEDFORD MA	LEXINGTON MINUTEMAN AND BEDFORD MINUTEMAN	
N93880.AR.000742	10/1/2004	8	CORRESPONDENCE	FACT SHEET FOR OPERABLE UNIT 4 SITE 4 NWIRP BEDFORD MA	U S NAVY	SITE 00004
N93880.AR.000751	12/1/2004	8	CORRESPONDENCE	FACT SHEET FOR OPERABLE UNIT 4 SITE 4 NWIRP BEDFORD MA	U S NAVY	SITE 00004
N93880.AR.000753	12/12/2004	7	CORRESPONDENCE	LETTER AND COMMENTS FROM THE U S EPA REGION I REGARDING DRAFT MONITORED NATURAL ATTENUATION ASSESSMENT FOR SITE 4 NWIRP BEDFORD MA	U S EPA REGION I	SITE 00004

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N93880.AR.000754	12/14/2004	3	CORRESPONDENCE	LETTER AND COMMENTS FROM THE MADEP REGARDING DRAFT MONITORED NATURAL ATTENUATION ASSESSMENT FOR SITE 4 REPORT NWIRP BEDFORD MA	MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION	SITE 00004
N93880.AR.000755	12/14/2004	9	CORRESPONDENCE	TECHNICAL REVIEW COMMITTEE MEETING MINUTES AND DRAFT AGENDA FOR 14 DECEMBER 2004 NWIRP BEDFORD MA	U S NAVY	
N93880.AR.000756	12/15/2004	27	CORRESPONDENCE	MINUTES FROM RESTORATION ADVISORY BOARD MEETING FROM 15 DECEMBER 2004 NWIRP BEDFORD MA	U S NAVY	
N93880.AR.000757	12/15/2004	1	PUBLIC NOTICE	NEWSPAPER NOTICE FOR RESTORATION ADVISORY BOARD MEETING 15 DECEMBER 2004 NWIRP BEDFORD MA	LEXINGTON MINUTEMAN AND BEDFORD MINUTEMAN	
N93880.AR.000758	12/17/2004	78	REPORT	FINAL THERMAL TREATMENT PILOT TEST AND REMEDIATION QUALITY ASSURANCE/QUALITY CONTROL PLAN ADDENDUM NUMBER 1 WITH TRANSMITTAL LETTER NWIRP BEDFORD MA	TETRA TECH FW	SITE 00003, SITE 00004
N93880.AR.000765	3/2/2005	11	CORRESPONDENCE	LETTER REGARDING RESTORATION ADVISORY BOARD MEETING MINUTES FOR 15 DECEMBER 2004 AND AGENDA FOR 16 MARCH 2005 RESTORATION ADVISORY BOARD MEETING MINUTES NWIRP BEDFORD MA	ENSR CONSULTING AND ENGINEERING	
N93880.AR.000767	4/25/2005	100	REPORT	AGENCY FOR TOXIC SUBSTANCES AND DISEASE REGISTRY ANNOUNCES PUBLIC HEALTH ASSESSMENT PUBLIC COMMENT RELEASE WITH TRANSMITTAL LETTER FOR NWIRP BEDFORD MA	AGENCY FOR TOXIC SUBSTANCES AND DISEASE REGISTRY	
N93880.AR.000770	6/1/2005	8	CORRESPONDENCE	LETTER REGARDING RESTORATION ADVISORY BOARD MEETING MINUTES FOR 16 MARCH 2004 NWIRP BEDFORD MA	ENSR CONSULTING AND ENGINEERING	
N93880.AR.000771	6/15/2005	23	CORRESPONDENCE	AGENDA FOR THE RESTORATION ADVISORY BOARD MEETING 15 JUNE 2005 INCLUDING MINUTES WITH OPERATIONS AND MAINTENANCE TASKS NWIRP BEDFORD MA	NAVFAC NORTHERN	
N93880.AR.000773	7/19/2005	5	CORRESPONDENCE	LETTER AND U S NAVY RESPONSES TO MADEP COMMENTS ON THE DRAFT MONITORED NATURAL ATTENUATION ASSESSMENT REPORT FOR SITE 4 NWIRP BEDFORD MA	ENSR CONSULTING AND ENGINEERING	SITE 00004
N93880.AR.000774	7/19/2005	15	CORRESPONDENCE	LETTER AND U S NAVY RESPONSES TO U S EPA REGION I COMMENTS ON THE DRAFT MONITORED NATURAL ATTENUATION ASSESSMENT REPORT FOR SITE 4 NWIRP BEDFORD MA	ENSR CONSULTING AND ENGINEERING	SITE 00004

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N93880.AR.000788	8/19/2005	113	REPORT	PUBLIC HEALTH ASSESSMENT WITH COVER LETTER NWIRP BEDFORD MA	AGENCY FOR TOXIC SUBSTANCES AND DISEASE REGISTRY	
N93880.AR.000780	11/22/2005	2	CORRESPONDENCE	LETTER AND COMMENTS FROM MADEP REGARDING THE MONITORED NATURAL ATTENUATION SAMPLING WORK PLAN FOR SITE 4 NWIRP BEDFORD MA	MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION	SITE 00004
N93880.AR.000782	12/15/2005	207	REPORT	DRAFT CLOSEOUT REPORT FOR SITE 4 THERMAL TREATMENT REMEDIATION PILOT TEST WITH TRANSMITTAL LETTER NWIRP BEDFORD MA	TETRA TECH EC	SITE 00004
N93880.AR.000834	9/1/2006	72	REPORT	FINAL SITE MANAGEMENT PLAN NWIRP BEDFORD MA	TETRA TECH	
TO BE ASSIGNED	3/1/2007		REPORT	DRAFT SEMI ANNUAL MONITORING REPORT APRIL 2006 SITE 3 IMMEDIATE RESPONSE ACTION NWIRP BEDFORD MA	ENVIRONMENTAL CHEMICAL CORPORATION	SITE 00003, SITE 00004
TO BE ASSIGNED	3/2/2007		REPORT	DRAFT SEMI ANNUAL MONITORING REPORT AUGUST 2006 SITE 3 IMMEDIATE RESPONSE ACTION NWIRP BEDFORD MA	ENVIRONMENTAL CHEMICAL CORPORATION	SITE 00003, SITE 00004
TO BE ASSIGNED	4/5/2007		REPORT	BEDROCK GROUNDWATER MONITORING REPORT 2005 - 2006 SITE 3 IMMEDIATE RESPONSE ACTION NWIRP BEDFORD MA	ENVIRONMENTAL CHEMICAL CORPORATION	SITE 00003, SITE 00004
N93880.AR.000830	9/26/2007	3	MINUTES	MEETING MINUTES FROM 26 SEPTEMBER 2007 RESTORATION ADVISORY BOARD MEETING NWIRP BEDFORD MA	U S NAVY	
N93880.AR.000827	2/7/2008	2	CORRESPONDENCE	LETTER WITH MADEP COMMENTS ON MONITORED NATURAL ATTENUATION ASSESSMENT REPORT FOR SITE 4 NWIRP BEDFORD MA	MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION	SITE 00004
TO BE ASSIGNED	2/22/2008		REPORT	DRAFT SEMI ANNUAL MONITORING REPORT AUGUST 2007 SITE 3 IMMEDIATE RESPONSE ACTION NWIRP BEDFORD MA	ENVIRONMENTAL CHEMICAL CORPORATION	SITE 00003, SITE 00004
N93880.AR.000826	3/7/2008	15	CORRESPONDENCE	LETTER WITH U S NAVY RESPONSES TO U S EPA REGION I COMMENTS ON DRAFT SAMPLING AND ANALYSIS PLAN NWIRP BEDFORD MA	TETRA TECH NUS	SITE 00003, SITE 00004, SFTA
TO BE ASSIGNED	3/7/2008		REPORT	BEDROCK GROUNDWATER MONITORING REPORT AUGUST 2007 SITE 3 IMMEDIATE RESPONSE ACTION NWIRP BEDFORD MA	ENVIRONMENTAL CHEMICAL CORPORATION	SITE 00003, SITE 00004

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TO BE ASSIGNED	3/10/2008	6	CORRESPONDENCE	LETTER WITH EPA COMMENTS ON MONITORED NATURAL ATTENUATION ASSESSMENT REPORT FOR SITE 4 NWIRP BEDFORD MA	U S EPA REGION I	SITE 00004
TO BE ASSIGNED	3/11/2008	66	REPORT	HEALTH AND SAFETY PLAN FOR LONG-TERM GROUNDWATER MONITORING, NWIRP BEDFORD MA	TETRA TECH NUS	SITE 00003, SITE 00004, SFTA
TO BE ASSIGNED	3/14/2008	529	REPORT	SAMPLING AND ANALYSIS PLAN FOR LONG-TERM GROUNDWATER MONITORING, NWIRP BEDFORD MA	TETRA TECH NUS	SITE 00003, SITE 00004, SFTA
N93880.AR.000824	3/17/2008	7	MINUTES	FINAL MEETING MINUTES FROM 9 JANUARY 2008 TECHNICAL MEETING NWIRP BEDFORD MA	TETRA TECH NUS	
TO BE ASSIGNED	5/12/2008	2	CORRESPONDENCE	LETTER WITH EPA COMMENTS ON REVISED FINAL PROPOSED PLAN, OU4, NWIRP BEDFORD MA	U S EPA REGION I	SITE 00004
N93880.AR.000349	5/15/2008	13	CORRESPONDENCE	LETTER AND U S NAVY RESPONSE TO U S EPA REGION I AND MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION REGARDING DRAFT MONITORED NATURAL ATTENUATION ASSESSMENT SITE 4 NWIRP BEDFORD MA	TETRA TECH NUS	SITE 00004
TO BE ASSIGNED	5/20/2008	2	CORRESPONDENCE	LETTER WITH DEP COMMENTS ON REVISED FINAL PROPOSED PLAN OU4 NWIRP BEDFORD MA	MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION	SITE 00004
TO BE ASSIGNED	6/11/2008	1	CORRESPONDENCE	E-MAIL WITH EPA APPROVAL OF NAVY RESPONSES TO COMMENTS ON SITE 4 MONITORED NATURAL ATTENUATION ASSESSMENT NWIRP BEDFORD MA	U S EPA REGION I	SITE 00004
TO BE ASSIGNED	6/12/2008	1	CORRESPONDENCE	E-MAIL WITH DEP APPROVAL OF NAVY RESPONSES TO COMMENTS ON SITE 4 MONITORED NATURAL ATTENUATION ASSESSMENT, NWIRP BEDFORD MA	MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION	SITE 00004
TO BE ASSIGNED	6/20/2008	1	CORRESPONDENCE	LETTER WITH DEP APPROVAL OF REVISED DRAFT FINAL PROPOSED PLAN, SITE 4, NWIRP BEDFORD MA	MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION	SITE 00004
TO BE ASSIGNED	6/26/2008	2	CORRESPONDENCE	LETTER WITH DEP COMMENTS ON DRAFT FEASIBILITY STUDY ADDENDUM #2 FOR SITE 4, NWIRP BEDFORD MA	MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION	SITE 00004
TO BE ASSIGNED	7/3/2008	1	CORRESPONDENCE	LETTER WITH EPA APPROVAL OF DRAFT PROPOSED PLAN SITE 4 NWIRP BEDFORD MA	U S EPA REGION I	SITE 00004
TO BE ASSIGNED	7/8/2008	1	CORRESPONDENCE	LETTER WITH EPA APPROVAL OF DRAFT FEASIBILITY ADDENDUM NO. 2, SITE 4, NWIRP BEDFORD MA	U S EPA REGION I	SITE 00004

**Record of Decision**  
**Naval Weapons Industrial Reserve Plant, Bedford, MA**  
**Appendices**

DOCUMENT NUMBER	RECORD DATE	NUMBER OF PAGES	RECORD TYPE	TITLE	AUTHOR AFFILIATION	SITES ADDRESSED
TO BE ASSIGNED	7/10/2008	1	PUBLIC NOTICE	LEGAL NOTICE IN THE BEDFORD MINUTEMAN AND THE LEXINGTON MINUTEMAN, PUBLIC INFORMATION MEETING AND PUBLIC HEARING, NWIRP BEDFORD MA	TETRA TECH NUS	SITE 00004
TO BE ASSIGNED	7/17/2008	1	PUBLIC NOTICE	LEGAL NOTICE IN THE BEDFORD MINUTEMAN AND THE LEXINGTON MINUTEMAN, POSTPONED PUBLIC COMMENT PERIOD, SITE 4 (BTEX FUEL AREA) AT THE NWIRP BEDFORD MA	TETRA TECH NUS	SITE 00004
N93880.AR.000184	7/21/2008	7	MINUTES	MINUTES AND AGENDA FOR RESTORATION ADVISORY BOARD MEETING HELD 23 APRIL 2008 WITH TRANSMITTAL LETTER NWIRP BEDFORD MA	TETRA TECH NUS	
TO BE ASSIGNED	7/24/2008		REPORT	FINAL CONSTRUCTABILITY EVALUATION FOR SITE 3 FULL-SCALE IMPLEMENTATION OF ERH THERMAL TREATMENT, NWIRP BEDFORD MA	TETRA TECH EC	SITE 00003
TO BE ASSIGNED	7/25/2008	529	REPORT	FINAL SUMMARY OF SAMPLING AND ANALYSIS RESULTS FOR COMPONENTS LABORATORY INVESTIGATION, NWIRP BEDFORD MA	TETRA TECH NUS	SITE 00003
TO BE ASSIGNED	7/28/2008	2	CORRESPONDENCE	LETTER WITH DEP COMMENTS ON REVISED DRAFT RECORD OF DECISION FOR SITE 4, NWIRP BEDFORD MA	MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION	SITE 00004
TO BE ASSIGNED	8/12/2008		REPORT	FINAL CLOSEOUT REPORT FOR SITE 3 THERMAL TREATMENT PILOT TEST, NWIRP BEDFORD MA	TETRA TECH EC	SITE 00003
TO BE ASSIGNED	8/12/2008		REPORT	FINAL CLOSEOUT REPORT FOR SITE 4 THERMAL TREATMENT REMEDIATION, NWIRP BEDFORD MA	TETRA TECH EC	SITE 00004
N93880.AR.000123	8/15/2008	55	REPORT	FEASIBILITY STUDY REPORT ADDENDUM 2 FOR SITE 4 NWIRP BEDFORD MA	TETRA TECH NUS	SITE 00004
N93880.AR.000535	8/15/2008	2	CORRESPONDENCE	LETTER REGARDING THE TRANSMITTAL OF FINAL FEASIBILITY STUDY ADDENDUM 2 AND U S NAVY RESPONSE TO MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION COMMENTS ON DRAFT FEASIBILITY STUDY ADDENDUM 2 FOR SITE 4 NWIRP BEDFORD MA	TETRA TECH NUS	SITE 00004
N93880.AR.000558	9/2/2008	6	MINUTES	MINUTES FOR TECHNICAL MEETING HELD 17 JULY 2008 FOR PH SAMPLING OF SELECTED SITE 3 BEDROCK WELLS NWIRP BEDFORD MA	TETRA TECH NUS	SITE 00003

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DOCUMENT NUMBER	RECORD DATE	NUMBER OF PAGES	RECORD TYPE	TITLE	AUTHOR AFFILIATION	SITES ADDRESSED
N93880.AR.000625	9/5/2008	1	CORRESPONDENCE	LETTER REGARDING TRANSMITTAL OF FINAL SEMI ANNUAL MONITORING REPORT FOR MARCH 2008 AT SITE 3 IMMEDIATE RESPONSE ACTION NWIRP BEDFORD MA	TETRA TECH NUS	SITE 00003 SITE 00004
N93880.AR.000627	9/5/2008	510	REPORT	MARCH 2008 SEMI-ANNUAL MONITORING REPORT FOR SITE 3 IMMEDIATE RESPONSE ACTION NWIRP BEDFORD MA	TETRA TECH NUS	SITE 00003 SITE 00004
N93880.AR.000626	9/5/2008	112	REPORT	SEMI-ANNUAL MONITORING REPORT FOR MARCH 2008, SOUTHERN FLIGHT TEST AREA, NWIRP BEDFORD MA	TETRA TECH NUS	SFTA
TO BE ASSIGNED	9/12/2008	2	CORRESPONDENCE	LETTER TO FINALIZE THE SOURCE AREA INVESTIGATION WORK PLAN AND REPORT/DATA PACKAGE, SITE 3 - NORTHWEST GROUNDWATER PLUME, NWIRP BEDFORD MA	TETRA TECH NUS	SITE 00003
TO BE ASSIGNED	9/12/2008	1	CORRESPONDENCE	LETTER TO FINALIZE THE REMOVAL ACTION SUMMARY REPORT, SITE 4 - BTEX PLUME, NWIRP BEDFORD MA	TETRA TECH NUS	SITE 00004
N93880.AR.000506	9/18/2008	85	REPORT	FINAL COMPONENTS LABORATORY SUMMARY REPORT AND FINAL COMPONENTS LABORATORY INVESTIGATION WORK PLAN, SITE 3, NWIRP BEDFORD MA	TETRA TECH NUS	SITE 00003
N93880.AR.000411	9/26/2008	76	REPORT	SITE MANAGEMENT PLAN NWIRP BEDFORD MA	TETRA TECH NUS	
N93880.AR.000859	9/29/2008	1	CORRESPONDENCE	LETTER REGARDING THE TRANSMITTAL OF FINAL MONITORED NATURAL ATTENUATION ASSESSMENT FOR SITE 4 NWIRP BEDFORD MA	TETRA TECH NUS	SITE 00004
N93880.AR.000858	9/29/2008	141	REPORT	FINAL MONITORED NATURAL ATTENUATION ASSESSMENT FOR SITE 4 NWIRP BEDFORD MA	TETRA TECH NUS	SITE 00004
N93880.AR.000594	10/16/2008	2	CORRESPONDENCE	LETTER AND U S NAVY RESPONSE TO MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION COMMENTS REGARDING REVISED DRAFT RECORD OF DECISION FOR SITE 4 NWIRP BEDFORD MA	TETRA TECH NUS	SITE 00004
TO BE ASSIGNED	10/31/2008	1	CORRESPONDENCE	MASS DEP COMMENTS ON REVISED (PRE-FINAL) PROPOSED PLAN FOR SITE 4 - BTEX PLUME, NWIRP BEDFORD, MASSDEP SITE#3-2611	MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION	SITE 00004
TO BE ASSIGNED	12/4/2008	2	CORRESPONDENCE	MASS DEP COMMENTS ON DRAFT FINAL RECORD OF DECISION FOR SITE 4 - BTEX FUEL AREA, NWIRP BEDFORD, MASSDEP SITE#3-2611	MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION	SITE 00004
TO BE ASSIGNED	1/8/2009	19	CORRESPONDENCE	EPA COMMENTS ON THE 2008 DRAFT FINAL RECORD OF DECISION, OU4, NWIRP BEDFORD (ALSO INCLUDES COMMENTS ON THE REVISED PROPOSED PLAN FOR SITE 4)	U.S. EPA REGION 1	SITE 00004

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DOCUMENT NUMBER	RECORD DATE	NUMBER OF PAGES	RECORD TYPE	TITLE	AUTHOR AFFILIATION	SITES ADDRESSED
N93880.AR.000736	1/16/2009	1	CORRESPONDENCE	LETTER REGARDING THE TRANSMITTAL OF FINAL SEMI-ANNUAL MONITORING REPORT FOR AUGUST 2008 SOUTHERN FLIGHT TEST AREA NWIRP BEDFORD MA	TETRA TECH NUS	SFTA
N93880.AR.000636	1/16/2009	126	REPORT	AUGUST 2008 SEMI-ANNUAL MONITORING REPORT FOR SOUTHERN FLIGHT TEST AREA NWIRP BEDFORD MA	TETRA TECH NUS	SFTA
N93880.AR.000812	1/22/2009	1	CORRESPONDENCE	LETTER REGARDING THE TRANSMITTAL OF FINAL AUGUST 2008 BEDROCK GROUNDWATER MONITORING REPORT FOR SITE 3 IMMEDIATE RESPONSE ACTION NWIRP BEDFORD MA	TETRA TECH NUS	SITE 00003 SITE 00004
N93880.AR.000749	1/22/2009	321	REPORT	AUGUST 2008 BEDROCK GROUNDWATER MONITORING REPORT FOR SITE 3 IMMEDIATE RESPONSE ACTION NWIRP BEDFORD MA	TETRA TECH NUS	SITE 00003 SITE 00004
N93880.AR.000860	2/6/2009	592	REPORT	AUGUST 2008 SEMI-ANNUAL MONITORING REPORT FOR SITE 3 IMMEDIATE RESPONSE ACTION NWIRP BEDFORD MA	TETRA TECH NUS	SITE 00003 SITE 00004
TO BE ASSIGNED	3/10/2009	759	REPORT	SAMPLING AND ANALYSIS PLAN FOR LONG-TERM GROUNDWATER MONITORING, NWIRP BEDFORD MA (REVISED FINAL)	TETRA TECH NUS	SITE 00003, SITE 00004, SFTA
TO BE ASSIGNED	3/25/2009	60	CORRESPONDENCE	EPA COMMENTS ON THE 2008 FEASIBILITY STUDY FOR SITE 3, OU1, NWIRP BEDFORD, MA	U.S. EPA REGION 1	SITE 00003
TO BE ASSIGNED	3/30/2009	3	CORRESPONDENCE	MASS DEP COMMENTS ON PRE-FINAL FEASIBILITY STUDY FOR SITE 3 - CHLORINATED SOLVENT PLUME, NWIRP BEDFORD, MASSDEP SITE#3-2611	MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION	SITE 00003
TO BE ASSIGNED	6/4/2009	32	CORRESPONDENCE	NAVY RESPONSE TO USEPA COMMENTS; PROPOSED PLAN AND RECORD OF DECISION FOR OU-4, BTEX PLUME SITE; NWIRP BEDFORD, MA	U.S. NAVY	SITE 00004
TO BE ASSIGNED	6/5/2009	5	CORRESPONDENCE	(EMAIL EPA APPROVAL OF) NAVY RESPONSE TO EPA COMMENTS ON SITE 4 PP & ROD FOR BEDFORD	U.S. EPA REGION 1	SITE 00004
TO BE ASSIGNED	6/8/2009	5	CORRESPONDENCE	EMAIL WITH MASSDEP APPROVAL OF PUBLIC MEETING FOR BEDFORD'S SITE 4 PROPOSED PLAN	MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION	SITE 00004
TO BE ASSIGNED	6/17/2009	16	PUBLIC NOTICE	PROPOSED PLAN, SITE 4 - BTEX PLUME, NWIRP BEDFORD, MA	TETRA TECH NUS	SITE 00004

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DOCUMENT NUMBER	RECORD DATE	NUMBER OF PAGES	RECORD TYPE	TITLE	AUTHOR AFFILIATION	SITES ADDRESSED
TO BE ASSIGNED	6/18/2009	1	PUBLIC NOTICE	LEGAL NOTICE IN THE BEDFORD MINUTEMAN AND THE LEXINGTON MINUTEMAN, RESTORATION ADVISORY BOARD (RAB) MEETING AND PUBLIC INFORMATION MEETING/PUBLIC HEARING FOR THE SITE 4 (BTEX PLUME) PROPOSED PLAN, NWIRP BEDFORD MA	TETRA TECH NUS	SITE 00003, SITE 00004, SFTA
TO BE ASSIGNED	6/30/2009	9	MINUTES	MEETING MINUTES FOR 16 JUNE 2009 TECHNICAL MEETING FOR SITE 4 RECORD OF DECISION NWIRP BEDFORD MA	TETRA TECH NUS	SITE 00004
TO BE ASSIGNED	7/9/2009	1	CORRESPONDENCE	EMAIL REGARDING OU4 RECORD OF DECISION REMAINING ISSUES	U.S. EPA REGION 1	SITE 00004
TO BE ASSIGNED	7/29/2009	4	CORRESPONDENCE	ADDENDUM TO THE JUNE 16, 2009 TECHNICAL MEETING MINUTES, SITE 4 (BTEX PLUME) RECORD OF DECISION, NWIRP BEDFORD	TETRA TECH NUS	SITE 00004
TO BE ASSIGNED	8/6/2009	21	MINUTES	MEETING MINUTES FOR THE RESTORATION ADVISORY BOARD MEETING HELD 14 JULY 2009 NWIRP BEDFORD MA	TETRA TECH NUS	
TO BE ASSIGNED	8/19/2009	100	REPORT	MARCH 2009 SEMI ANNUAL MONITORING REPORT FOR SOUTHERN FLIGHT TEST AREA NWIRP BEDFORD MA	TETRA TECH NUS	SFTA
TO BE ASSIGNED	8/20/2009	711	REPORT	MARCH 2009 SEMI ANNUAL MONITORING REPORT FOR SITE 3 IMMEDIATE RESPONSE ACTION NWIRP BEDFORD MA	TETRA TECH NUS	SITE 00003, SITE 00004





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**Appendix E1: Transcript of Public Hearing on the 2002 Proposed Plan**

**PUBLIC HEARING  
5/14/2002**

 **ORIGINAL**

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PROPOSED PLAN  
OPERABLE UNIT 4, SITE 4  
NAVAL WEAPONS INDUSTRIAL RESERVE PLANT  
PUBLIC HEARING

TAKEN AT: BEDFORD TOWN HALL  
MUDGE WAY  
BEDFORD, MASSACHUSETTS

TAKEN ON: MAY 14, 2002 at 8:30 p.m

Maryellen Coughlin  
Registered Professional Reporter

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**PUBLIC HEARING**

**5/14/2002**

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P R O C E E D I N G S

MR. KRIVANSKY: Good evening.

This is the public hearing for the Site 4  
Proposed Plan for Operable Unit 4 here at Naval  
Weapons Industrial Reserve Plant in Bedford,  
Massachusetts. My name, again, is Mark  
Krivansky. I'm the remedial project manager,  
and we are here -- the purposes for which we are  
here is for this public hearing to give the  
community an opportunity to review, to go on  
record, to be heard, I guess, for the Site 4  
Proposed Plan and the remedy of which the navy  
is proposing. We have a stenographer this  
evening who will record the oral comments that  
anyone would like to make this evening. No  
comments will be responded to. As I mentioned  
earlier, they will be made part of the response  
to the summary of which the Navy will then  
respond to those comments in the response to the  
summary that will be attached to the record of  
decision submitted in a final version this fall.

I would also like to remind  
everybody that we do have forms over here along

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**PUBLIC HEARING**

**5/14/2002**

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1 with copies of the proposed plan. You can take  
2 those and submit written copies this evening and  
3 drop them in the box. I know there's one there  
4 already. Or you could mail them, fax them or  
5 e-mail them to me. The last slide will have my  
6 address, fax number, and e-mail number on it,  
7 and phone number. I would ask that anyone who  
8 would like to make a formal oral comment to come  
9 to the front of the row of chairs here and state  
10 their name and also spell their last name and  
11 make their comment.

12 At this time anybody who would  
13 like to, please step forward and make your  
14 comment. We'll record it. Somebody has to be  
15 first.

16 Well, I will wait a few minutes.  
17 We began this at I believe 8:45, so we will wait  
18 a few minutes. I'm not sure if anybody will  
19 arrive late or not, but we would like to give  
20 that opportunity, so.

21 It doesn't appear that we're going  
22 to get any oral comments this evening. What I  
23 would like to remind everybody who is left here  
24 is that my address is up here where you can send

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**PUBLIC HEARING**

**5/14/2002**

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1 any written comments, along with my phone number  
2 and e-mail. And if anyone is interested in  
3 faxing them, my fax number is not there, but I  
4 will give that. My fax number is (610)  
5 595-0555. Those are all avenues to reach us  
6 during the comment period which closes May 31st.

7 I'd like to thank everybody for  
8 their participation in the evening through the  
9 poster session, with the public meeting and  
10 informational session of the Site 4 RAB meeting  
11 and public hearing which we're going to wrap up  
12 now. Thank you.

13 (Hearing concluded at 8:45 p.m.)  
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**PUBLIC HEARING  
5/14/2002**

**CERTIFICATE OF REPORTER**

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I, MARYELLEN COUGHLIN, Registered  
Court Reporter, hereby certify that the  
foregoing transcript consisting of 5 pages is a  
complete, true, and accurate transcript of the  
Public Hearing held on May 14, 2002, at Bedford  
Town Hall, Bedford, Massachusetts.

I further certify that this proceeding  
was reported by me, and that the foregoing  
transcript has been prepared by me.


*Maryellen Coughlin*  
Maryellen Coughlin

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**Appendix E2: Comments Received during the 2002 Public Comment Period**

<b>We Welcome Your Comments!</b>	<b>9</b>	
<p><b>What's a Formal Comment?</b></p> <p>Federal regulations make a distinction between "formal" comments received during the 30-day public comment period, and "informal" comments received outside this comment period. While the Navy uses comments throughout the cleanup process to help make cleanup decisions, the Navy is required to respond to formal comments.</p> <p>Formal comments can be in writing or made orally. To make a formal comment on this Proposed Plan, you need only to (1) offer oral or written comments during the public information session or public hearing on May 14, 2002 or (2) send written comments, post marked no later than May 31, 2002.</p> <p>Your formal comments will become a part of the official record for Site 4. This is a crucial element in the decision making process for the site. The Navy will consider all comments received during the comment period prior to making the final cleanup decision for Site 4.</p> <p><b>Use this form!</b></p> <p>The Navy encourages your written comments on the Proposed Plan for Site 4 at NWIRP Bedford. You can use the form below to send written comments. If you have questions about how to comment, please call Mark Krivansky at (610) 595-0567 ext. 153. This form is provided for your convenience. Please mail this form or additional sheets of written comments, postmarked no later than May 31, 2002.</p> <p><b>Please use this space for comments.</b></p> <div style="border: 1px solid black; padding: 10px; min-height: 200px;"><p style="font-size: 1.2em;">I support The Navy to process cleanup The site #4. After cleanup is done The Navy should continue their operations at the NWIRP Bedford Facility. The Navy should continue use this Facility to do Business with The Raytheon Company.</p><p style="text-align: right; font-size: 1.2em;">NWIRP Bedford Facility Bedford, Massachusetts</p></div> <div style="border-top: 1px solid black; padding-top: 10px;"><p><b>Comments submitted by:</b> <span style="float: right;">John Stella</span></p><p><b>Address:</b> <span style="float: right;">P.O. Box 543 Bedford, MA. 01730</span></p></div>		



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**Appendix E3: Transcript of Public Hearing on the 2009 Proposed Plan**

PROPOSED PLAN  
OPERABLE UNIT 4, SITE 4 - BTEX PLUME  
NAVAL WEAPONS INDUSTRIAL RESERVE PLANT  
PUBLIC HEARING

TAKEN AT: BEDFORD TOWN HALL  
10 MUDGE WAY  
BEDFORD, MASSACHUSETTS

TAKEN ON: JULY 14, 2009, AT 7:37 P.M.

*Leavitt Reporting, Inc.*

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*Hearings ♦ Conferences ♦ Legal Proceedings*

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P R O C E E D I N G S

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2 MR. ROPP: I think we're all set to begin the  
3 hearing. Welcome everyone to the public hearing for the  
4 Site 4 Proposed Plan for the Naval Weapons Industrial  
5 Reserve Plant in Bedford, Massachusetts. Site 4 is also  
6 known as Operable Unit 4 or the BTEX Plume. The Navy's  
7 proposed remedy for Site 4 consists of additional source  
8 area excavation followed by monitored natural attenuation  
9 of groundwater. The Navy is proposing interim land use  
10 controls to be set up and coordinated with the Town until  
11 the remedial goals are achieved for the site.

12 The Navy issued the Site 4 Proposed Plan  
13 on June 17th and we just had a general information session  
14 to support the proposed plan and describe what's going on.  
15 The purpose of this hearing now is to give the public an  
16 opportunity to provide your formal comments to the Navy.  
17 We have a stenographer here with us who will make a  
18 transcript of this hearing and that transcript will become  
19 part of the official Record of Decision.

20 Since this is just a hearing, we will not  
21 be answering questions at this point, but we will be  
22 recording all your comments, questions or whatnot, and we  
23 will be responding to those formally in writing as part of

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**Record of Decision  
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1 the Record of Decision, along with any written comments  
2 that are provided during the 30-day public comment period.

3 So with that said, I'd like to invite  
4 anyone to make any comments, questions, approvals of the  
5 Proposed Plan for Site 4.

6 It appears -- yes, please.

7 MR. COREY: My name is Donald Corey. I'm the  
8 community co-chair for the RAB of Bedford, and the Town  
9 does intend to fully cooperate with the Navy on protecting  
10 groundwater and preventing use of groundwater in the area  
11 that's contaminated, and I anticipate that we will have a  
12 letter to the Navy before the end of the comment period.

13 MR. ROPP: All right, thank you. Any other  
14 comments? Questions? Then if we're all set, I'll just  
15 remind everyone that the Proposed Plan, we have additional  
16 copies here tonight. There is a form in there. If you can  
17 provide comments in writing postmarked by this Friday, we  
18 will include it in our response document and official  
19 record. So with that, thank you all. We'll consider the  
20 hearing closed. Thank you.

21 (whereupon the hearing adjourned at  
22 7:40 p.m.)  
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Naval Weapons Industrial Reserve Plant, Bedford, MA  
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CERTIFICATE

I hereby certify that the foregoing 3 pages contain a full, true and accurate transcript of all my stenographic notes to the best of my ability taken in the above-captioned matter held at the offices of Bedford Town Hall on Tuesday, July 14, 2009, commencing at 7:37 p.m.



KATHLEEN M. BENOIT

Notary Public

My commission expires

May 25, 2012

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**Appendix E4: Comments Received during the 2009 Public Comment Period**

**COMMENT SHEET – Proposed Plan for Site 4, BTEX Plume**

Use this space to write your comments.

The Navy encourages your written comments on the Proposed Plan for Site 4 – BTEX Plume at the former Naval Weapons Industrial Reserve Plant (NWIRP), Bedford, Massachusetts. You can use the form below to send written comments. If you have questions about how to comment, please call the Navy Public Affairs Office at (757) 445-8732 ext. 3096. This form is provided for your convenience.

Please mail this form or additional sheets of written comments, postmarked no later than July 17, 2009, to the address shown below:

NAVFAC MID-ATLANTIC  
Attn: Public Affairs Officer, Code 09PA  
9742 Maryland Ave.  
Norfolk, VA 23511-3095

I Strongly Supported The US Navy proposed  
Cleanup at the former Naval Industrial Weapons  
Reserve Plant in Bedford, MA.

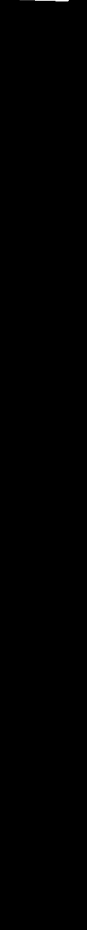
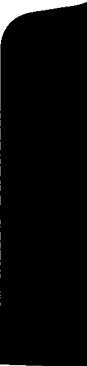
I would Recommend The Navy Should  
consider US Navy Training Center or US Navy  
Recruitment Center after The Cleanup is over.  
This site would provide training for Naval Reserve.

Comment Submitted by:

John M. Stella

Address:

PO Box 543 Bedford, MA 01730



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**APPENDIX F  
SYNOPSIS OF ARARS FOR SC-5/MM-2: SOURCE EXCAVATION AND MONITORED NATURAL ATTENUATION  
NWIRP BEDFORD, MASSACHUSETTS**

Media	Requirement	Requirement Synopsis	Status and Action to be Taken to Attain Requirement	Status
<b>Chemical-Specific ARARs</b>				
<b>Federal</b>				
All	Risk Assessment Guidance – Cancer Slope Factors	Guidance used in human health risk assessments as guidance values to evaluate the potential carcinogenic hazard caused by exposure to chemicals of concern.	None (used for risk calculations); however, this alternative will address the identified risks determined by use of this guidance through a combination of source area excavation, institutional controls, and monitored natural attenuation which will prevent potential carcinogenic risks caused by exposure to contaminated groundwater.	To Be Considered
All	EPA Reference Dose (RfD) Guidance	Guidance used to characterize human health risks associated with non-carcinogens in site media.	None (used for risk calculations); however, this alternative will address the identified risks determined by use of this guidance through a combination of source area excavation, institutional controls, and monitored natural attenuation which will prevent potential non-carcinogenic risks caused by exposure to contaminated groundwater.	To Be Considered
All	Guidelines for Carcinogen Risk Assessment EPA/630/P-03/001F (March 2005)	Guidance for assessing cancer risk.	This alternative will meet this standard because a combination of source area excavation, institutional controls, and monitored natural attenuation will prevent potential carcinogenic risks caused by exposure to contaminated groundwater.	To Be Considered
All	Supplemental Guidance for Assessing Susceptibility from Early-Life Exposure to Carcinogens EPA/630/R-03/003F (March 2005)	Guidance of assessing cancer risks to children.	This alternative will meet this standard because a combination of source area excavation, institutional controls, and monitored natural attenuation will prevent potential carcinogenic risks to children caused by exposure to contaminated groundwater.	To Be Considered.
Groundwater	Safe Drinking Water Act (SDWA) Maximum Contaminant Levels (MCLs) 40 CFR Part 141 Subpart B (141.11 – 141.16)	MCLs are enforceable standards that regulate the concentration of specific organic and inorganic contaminants that have been determined to adversely affect human health in public drinking water supplies. They also may be considered relevant and appropriate for groundwater aquifers potentially used for drinking water.	The groundwater at Site 4 has been designated as high use and value by the MassDEP. Therefore, MCLs will be used as cleanup goals and must be achieved throughout the plume and source area through remedial action at Site 4 to achieve the RAO defined. Source area excavation and monitored natural attenuation of the contamination plume will achieve these standards within 5 to 10 years. Institutional controls will be established to prevent exposure to contaminated groundwater until the standards are achieved.	Relevant and Appropriate

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Media	Requirement	Requirement Synopsis	Status and Action to be Taken to Attain Requirement	Status
Groundwater	SDWA Maximum Contaminant Level Goals (MCLGs) 40 CFR Part 141 141.50 – 141.51	Non-zero MCLGs are non-enforceable health goals for public water systems. MCLGs are set at levels that would result in no known or expected adverse health effects with an adequate margin of safety. Non-zero MCLGs are to be used as cleanup goals when MCLs have not been established for a particular compound of concern.	The groundwater at Site 4 has been designated as high use and value by the MassDEP. Therefore, non-zero MCLGs will be used as cleanup goals and must be achieved through the plume and source area through remedial action at Site 4 to achieve the RAO defined. Source area excavation and monitored natural attenuation of the contamination plume will achieve these standards within 5 to 10 years. Institutional controls will be established to prevent exposure to contaminated groundwater until the standards are achieved.	Relevant and Appropriate
<b><u>State</u></b>				
Groundwater	MA Drinking Water Standards, 310 CMR 22.00	These regulations establish state MCLs for public water supply systems. If State MCLs are more stringent than federal levels, the state levels are used as the ARAR.	The groundwater at Site 4 has been designated as high use and value by the MassDEP. Certain MassDEP MCLs are more stringent than Federal MCLs, and therefore will be used as cleanup goals and must be achieved throughout the plume and source area through remedial action at Site 4 to achieve the RAO defined. Source area excavation and monitored natural attenuation of the contamination plume will achieve these standards within 5 to 10 years. Institutional controls will be established to prevent exposure to contaminated groundwater until the standards are achieved.	Relevant and Appropriate
Groundwater	MA Groundwater Quality Standards 314 CMR 6.06	These standards limit the concentration of certain materials allowed in classified MA waters.	The groundwater at Site 4 has been designated as high use and value by the MassDEP. Remedial action for Site 4 will use these standards as cleanup goals for the source area and the plume if they are more stringent than the federal MCL or non-zero MCLG and the state MCL. Source area excavation and monitored natural attenuation of the contamination plume will achieve these standards within 5 to 10 years. Institutional controls will be established to prevent exposure to contaminated groundwater until the standards are achieved..	Applicable

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Media	Requirement	Requirement Synopsis	Status and Action to be Taken to Attain Requirement	Status
<b>Action-Specific ARARs</b>				
<b><u>Federal</u></b>				
All	RCRA Identification and Listing of Hazardous Wastes, Toxicity Characteristic (40 CFR 261.24)	Massachusetts has been delegated the authority to administer these RCRA standards through its State hazardous waste management regulations. These requirements identify the maximum concentrations of contaminants for which the waste would be a RCRA characteristic waste because of its toxicity. The analytical test set out in Appendix II of 40 CFR Part 61 is referred to as the Toxicity Characteristic Leaching Procedure (TCLP).	Any investigation-derived wastes from installation of monitoring wells will be analyzed by the TCLP to determine whether they are characteristic hazardous waste under RCRA. Wastes that are determined to exceed TCLP allowable concentrations and therefore be hazardous will be disposed off-site in a RCRA Subtitle C or state-equivalent TSDF. Wastes that are determined to be below TCLP allowable concentrations and therefore nonhazardous will be disposed of off-site in a RCRA Subtitle D or state-equivalent TSDF. Similarly, wastes generated as part of excavation, or wastes from the treatment of excavation water (residues/filters) will be characterized as hazardous or non-hazardous and will be stored, transported, and disposed of in accordance with these standards.	Applicable
Waste	RCRA Interim Status: Chemical, Physical, or Biological Treatment (40 C.F.R. Part 265, Subpart Q)	Standards for using chemical, physical, or biological treatment at hazardous waste facilities.	The ex-situ biopile component of the remedy, whether it contains hazardous waste or not, will be constructed, managed, monitored, and closed based on the relevant and appropriate standards in these regulations.	Relevant and Appropriate
Air	Clean Air Act, 42 U.S.C. § 112(b)(1), National Emission Standards for Hazardous Air Pollutants (NESHAPS), 40 C.F.R. Part 61	The regulations establish emission standards for 189 hazardous air pollutants. Standards set for dust control and other release sources.	Emissions of fugitive dust will be managed through engineering and other controls during remedial activities.	Applicable
Groundwater Treatment	Clean Water Act (33 U.S.C. §§ 1251 <i>et seq.</i> ); Underground Injection Control; 40 CFR 144, 146, 147	Standards for the discharge of treatment water into the ground.	Discharge of treated excavation water from the treatment plant to the ground will meet these standards.	Relevant and Appropriate
Storm water	Clean Water Act (33 U.S.C. §§ 1251 <i>et seq.</i> ); Storm water requirements for construction sites; 40 CFR 122.26; (60 FR 50804), September 29, 1995	Applicable to construction activity including clearing, grading and excavation, except operations that result in the disturbance of more than five acres of total land area.	Excavation and well installation/maintenance activities will comply with these requirements through the use of best management practices during activities that disturb the soil. Although the activities at the Site are expected to disturb less than 5 acres of land area these standards to prevent erosion from storm events will be met.	Relevant and Appropriate

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Media	Requirement	Requirement Synopsis	Status and Action to be Taken to Attain Requirement	Status
<b>Location-Specific ARARs</b>				
<b><u>Federal</u></b>				
	None identified			
<b><u>State</u></b>				
Wetlands	MA Wetland Protection Requirements 310 CMR 10.00	These requirements regulate activities in freshwater wetlands, 100-year floodplains, 100-foot buffer zone to vegetated wetlands, and 200-foot buffer zone to waterways (Elm Brook). Regulated activities include certain types of construction and excavation activities. Performance standards are provided and include evaluating the acceptability of various activities.	Although this alternative does not include the construction of a treatment system or any other major construction project within the wetlands and their buffer zones associated with Elm Brook, it may include installation of monitoring wells within this area. As such, actions taken under this alternative will be performed in compliance with the performance standards of these requirements. Any temporary disturbance of a wetland will be restored.	Applicable

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Media	Requirement	Requirement Synopsis	Status and Action to be Taken to Attain Requirement	Status
Groundwater	MA Underground Injection Control Program (310 CMR 23.01-23.11)	These regulations require acquiring a permit in order to inject wastes, chemicals or other substances into the subsurface.	These standards regulate the use of oxygen releasing compounds into the groundwater for enhanced bioremediation. To ensure that the oxygen releasing compound injection complies with the substantive requirements of these regulations the proposed quantities to be injected will be included in the design and submitted to EPA and MassDEP for comment and concurrence and the groundwater monitoring program will assess the impact of the oxygen releasing compounds. Discharge of treated excavation water into groundwater will also meet these standards.	Relevant and Appropriate
Surface Water	MA Surface Water Discharge Permit Program (314 CMR 3.00)	This program establishes requirements intended to maintain the quality of surface waters by controlling the direct discharge of pollutants to surface waters. Direct discharges of wastewater to surface waters must meet effluent discharge limits established by this program.	Current treated discharge from the IRA groundwater treatment system is made to the ground and permeates the soil prior to contacting designated wetlands. As a result, no observable discharge is made to the surface water of the U.S. Should the addition of extraction wells to the system increase discharge to the point that an observable stream discharges to the wetland, the discharge will meet the substantive requirements of these regulations.	Potentially Applicable
Water	MA Groundwater Discharge Permit Program (314 CMR 5.00)	This program is designed to protect state groundwater for its highest potential use by regulating discharges of pollutants to state groundwaters and requiring MassDEP to regulate the outlet for groundwater dischargers and associated treatment works.	Current treated discharge from the IRA groundwater treatment system are made to the ground and permeates the soil prior to contacting designated wetlands. As such, the substantive portions of these regulations will be complied with.	Applicable
Air	MA Air Pollution Control (310 CMR 7.18)	This program regulates facilities that emit volatile or halogenated organic compounds.	The biopile component of the remedy will be constructed, managed, monitored, and closed in compliance with these regulations.	Relevant and Appropriate
Soil	Massachusetts Erosion and Sediment Control Guidelines for Urban and Suburban Areas	Guidance for preventing erosion and sedimentation.	Remedial actions will be managed to prevent the migration of disturbed soils.	To Be Considered
All	Massachusetts Ambient Air Quality Standards, 310 C.M.R. § 6.00	These regulations set primary and secondary standards for emissions of certain contaminants, including particulate matter.	Emissions of fugitive dust will be managed through engineering and other controls during remedial activities.	Applicable
All	Massachusetts Air Pollution Control Regulations, 310 C.M.R. § 7.00	These regulations set emission limits necessary to attain ambient air quality standards, including standards for visible emissions (310 C.M.R. § 7.06), dust, odor and demolition (310 C.M.R. § 7.09 0, and noise (310 C.M.R. § 7.10).	Emissions of fugitive dust will be managed through engineering and other controls during remedial activities.	Applicable
Storm water	MA Solid Waste Management Storm Water Controls (310 CMR 19.115)	These are requirements for storm water controls based on performance standards and design criteria.	This remedial alternative would meet the design and performance standards of these requirements.	Applicable

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Media	Requirement	Requirement Synopsis	Status and Action to be Taken to Attain Requirement	Status
Wastewater	MA Hazardous Waste Rules – Special requirements for wastewater treatment units (310 CMR 30.605)	Standards for wastewater treatment units for the treatment of hazardous waste.	If it is necessary to treat water from excavations contaminated with hazardous wastes prior to discharge to groundwater, then the requirements of these regulations will be met.	Relevant and Appropriate
Wastewater	MA Supplemental Requirements for Hazardous Waste Management Facilities (314 CMR 8.03)	This regulation outlines the additional requirements that must be satisfied in order for a RCRA facility to comply with the discharge regulation.	Any excavation water treatment facilities will meet these regulations through a monitoring program and engineering controls, if necessary.	Relevant and Appropriate
Wastewater	MA Operation and Maintenance and Pretreatment Standards for Wastewater Treatment Works and Indirect Discharges (314 CMR 12.03(8); 12.04(2),(3),(5),(8-12), 12.05(1),(6),(12), 12.06(1-3)	Establishes operation and maintenance standards for treatment works.	The wastewater treatment system, although not "treatment works," will not allow waste to bypass system, will have an alarm system in place, and will be maintained properly and safely with adequate tools, equipment, parts, personnel, etc. Sampling and analysis will be conducted according to the site plan.	Relevant and appropriate
Groundwater	MA Standards for Analytical Data for Remedial Response Action Bureau of Waste Site Cleanup Policy 300-89	This policy describes the minimum standards for analytical data submitted to the MassDEP.	This alternative includes groundwater monitoring as a component, which infers that a sampling and analysis plan will be developed if this alternative were implemented. Any plan developed for this purpose would consider the analytical methods provided in this policy.	To Be Considered

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Media	Requirement	Requirement Synopsis	Status and Action to be Taken to Attain Requirement	Status
All	Hazardous Waste Regulations, 310 C.M.R. § 30.100	These regulations establish requirements for determining whether wastes are hazardous.	The determination of whether wastes generated as a part of this remedial action are hazardous will be done according to these regulations.	Applicable
All	MA Hazardous Waste Management Rules (HWMR) Requirements for Generators 310 CMR 30.300	These regulations contain requirements for generators of hazardous waste. The regulations apply to generators of sampling waste and also apply to the accumulation of waste prior to off-site disposal.	Wastes generated during remedial actions that are determined to be hazardous will be handled in compliance with the substantive requirements of these regulations.	Applicable
All	Hazardous Waste Management Rules - General standards for hazardous waste facilities (310 C.M.R. 30.500)	General facility requirements for waste analysis, security measures, inspections, personnel training, and closure/post-closure.	Remedial activities to address hazardous wastes will be conducted in accordance with this requirement. Specifically, storage of wastes on site will be conducted in accordance with this regulation. All workers will be properly trained. Closure/post-closure standards will be met since all wastes will be excavated and treated on site or removed from the site as needed.	Applicable
All	MA HWMR Use and Management of Containers 310 CMR 30.680 and Storage and Treatment in Tanks 310 CMR 30.690	These regulations set forth requirements for use and management of containers and tanks at hazardous waste facilities.	Hazardous waste containers used during the remedial action would comply with these requirements. It is anticipated that storage of hazardous waste will be done in a portable roll-off container. However, if the remedial action requires storage of hazardous waste in tanks, then management procedure requirements will be followed.	Applicable
All	Hazardous Waste Regulations – Groundwater Protection, 310 C.M.R. 660	Facility standards for the protection of groundwater. Groundwater standards must be met beyond a point of compliance (310 C.M.R. § 669)	The protection of groundwater, as necessary, will be achieved by compliance with these standards.	Applicable
Water	MA HWMR Groundwater Protection 310 CMR 30.660-30.679	These regulations require groundwater monitoring at specified regulated units that treat, store, or dispose of hazardous waste. Maximum concentrations limits for the hazardous constituents are specified in 310 CMR 30.668.	This alternative includes groundwater monitoring as a component. The program described in the detailed description will comply with the substantive sections of these requirements.	Applicable
Waste	MA Hazardous Waste Rules – Waste Piles (310 CMR 30.640)	These standards prescribe requirements which apply to owners and operators of facilities that use waste piles to store or treat hazardous waste.	The biopiles, whether they contain hazardous waste or not, will be constructed, managed, monitored, and closed based on the relevant and appropriate standards in these regulations.	Relevant and Appropriate

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Media	Requirement	Requirement Synopsis	Status and Action to be Taken to Attain Requirement	Status
Waste	RCRA Use and Management of Containers 40 CFR Part 264 Subpart I	Sets standards for the storage of hazardous wastes in containers.	The installation of monitoring wells in the management of migration area may generate limited spoil requiring disposal. If this remedy involves the storage of hazardous waste in containers (e.g., drums or tanks) prior to treatment, the substantive requirements of this regulation will be achieved.	Relevant and Appropriate
Groundwater	RCRA Releases from Solid Waste Management Units 40 CFR Part 264, Subpart F (40 CFR 264.90- 264.101)	These regulations establish requirements for groundwater monitoring.	Groundwater monitoring will be conducted in accordance with the substantive requirements of these regulations.	Relevant and Appropriate
Surface Water	Clean Water Act (33 U.S.C. § 1251 <i>et seq.</i> ); National Recommended Water Quality Criteria (NRWQC) (40 C.F.R. § 122.44)	Federal NRWQC include (1) criteria for protection of human health from toxic properties of contaminants ingested through drinking water and aquatic organisms, and (2) criteria for protection of aquatic life.	Contaminant concentrations in Elm Brook and the associated wetlands will be measured during monitoring to determine whether water quality is being impacted by contaminated groundwater, and to ensure that NRWQC are being met.	Relevant and Appropriate
Waste	EPA OSWER Publication 9345.3-03 FS, January 1992	Management of IDW must ensure protection of human health and the environment.	IDW that may be produced from well installation and groundwater sampling will comply with ARARs.	To Be Considered
Groundwater	Use of Monitored Natural Attenuation at Superfund, RCRA Corrective Action, and UST Sites, EPA OSWER Directive 9200.4-17 (9/97).	This directive provides guidance regarding the use of monitored natural attenuation for the remediation of contaminated groundwater.	Under this alternative, groundwater monitoring will be conducted so as to meet the objectives of this directive. This alternative, Source Excavation and Treatment/MNA, is calculated to achieve groundwater standards in 5 to 10 years.	To Be Considered
<b><u>State</u></b>				
Soil	Massachusetts Contingency Plan (MCP), 310 CMR 40.0933 and 40.0970	Describes procedures for evaluating the risks posed by oil and/or hazardous material at disposal sites. "Method 1" promulgated standards are used to determine the need for a remedial action or to demonstrate that a level of no significant risk of harm to health, public welfare and the environment exists or has been achieved at a state-listed disposal site. The Method 1 regulations set numeric soil cleanup standards to prevent impacts to groundwater.	Method 1 standards will be used in the delineation of the source area excavation and as treatment standards for the ex-situ bioremediation of excavated soil which is to be reused at the site.	Relevant and Appropriate



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**Appendix G: Groundwater Use and Value Determination Letter**

**GROUNDWATER USE AND VALUE DETERMINATION**  
Naval Weapons Industrial Reserve Plant, Bedford, Massachusetts  
October 1998

Pursuant to the Memorandum of Agreement between the EPA and the DEP concerning Ground Water Use and Value Determinations, and consistent with the Environmental Protection Agency's (EPA) 1996 Final Ground Water Use and Value Determination Guidance, the Department has developed a "Use and Value Determination" of the groundwater impacted by the Naval Weapons Industrial Reserve Plant (NWIRP) Superfund Site (the "Site"). The purpose of the Use and Value Determination is to identify whether the aquifer related to the Site is of "High, Medium," or "Low" use and value. In the development of its Determination, the Department has applied the criteria for groundwater classification as promulgated in the Massachusetts Contingency Plan (MCP). The classification contained in the MCP considers criteria similar to those recommended in the Use and Value Guidance. **The Department's determination for this Site is high use and value.** This determination is explained in more detail below.

The NWIRP Site occupies approximately 46 acres in the town of Bedford. NWIRP is part of a larger industrial complex located immediately north of Hanscom Air Force Base, which is also a Superfund Site. NWIRP and the Raytheon Missile Systems Division (RMSD), also located within the industrial complex, are operated by Raytheon Co. NWIRP's mission began in 1952 when a missile and radar development laboratory was built. Then known as the Naval Industrial Research Aircraft Plant (NIRAP), the laboratory provided facilities for research and development of radar, missile guidance systems, and related equipment. Flight test facilities were added on the southern portion of the site in 1959. Between 1959 and 1977, the Navy obtained about 43 additional acres from the Air Force. Buildings constructed during the past 25 years include large facility storage and government buildings near the northern property boundary, an Antenna Range Building, air conditioning and incineration facilities, and the Advanced Medium Range Air to Air Missile Development (AMRAD) Building. NWIRP currently is used for advanced technology research in weapons systems development. These activities include the design, fabrication, and testing of prototype equipment such as missile guidance and control systems. There are two primary operating areas at NWIRP: the Components Laboratory and the Flight Test Facility. Approximately 21 other buildings house various support activities related to the work at these two centers. Wastes generated at NWIRP include various volatile organic compounds (VOCs), photographic fixer, waste oil and coolants, lacquer thinner, unspecified solvents and thinners, Stoddard solvent, waste paint, and chromic, sulfuric, nitric, hydrochloric, and phosphoric acids. In 1986, the Navy initiated a study to determine potential contaminant sources at NWIRP. Contaminants in soil and groundwater include petroleum compounds, primarily BTEX, and chlorinated solvents, primarily trichloroethylene. Operation of groundwater collection system began in 1997 to treat and contain contamination in the groundwater migrating from the northwest area of NWIRP. Extraction of groundwater is intended to prevent VOC contamination from potentially migrating north toward Elm Brook.

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## Naval Weapons Industrial Reserve Plant Bedford

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The groundwater beneath and around the area of the HAFB site is classified as GW-1 under the MCP. Groundwater is classified as GW-1 because it is currently used for, or considered to be a potential future source of, public water supply. A portion of the aquifer falls within the mapped Zone II area of the Hartwell Road municipal water supply wellfield. The Hartwell Road Wellfield, part of the municipal water supply for the Town of Bedford, is located less than 1/2 mile northwest of NWIRP. The three wells located in this wellfield were closed in 1984 after VOC contamination was found in two of the wells. Investigations conducted by the Air Force, NWIRP, Raytheon and the Town of Bedford have been inconclusive in identifying a specific source of contamination which caused the shutdown of the wellfield. The entire wellfield remains inactive, but has not been officially abandoned under DEP regulations, and the Town has contingency plans to reactivate them at sometime in the future.

The Town of Bedford has also, in accordance with Massachusetts regulations, designated this area as an Aquifer Protection District in order to protect it as a source of municipal water supply.

Either of the two conditions above, groundwater within a mapped Zone II of a current public water supply, or groundwater within the area of an Aquifer Protection District, meet the criteria for classification as GW-1 under the MCP and therefore is determined to be of high use and value. In addition, all groundwater within the Commonwealth is considered to eventually discharge to a surface water body and is therefore classified as GW-3 under the MCP. The GW-1 classification is intended to ensure water quality sufficient for public consumption and the GW-3 classification is to ensure the water quality at the time of discharge to surface water is protective for non-consumptive public health exposures and for environmental receptors.

The Shawsheen River provides drinking water through intakes approximately 7 miles downstream. Extensive wetlands and several species of rare fauna and flora are found along Elm Brook and the Shawsheen River. The Shawsheen drinking water sources are not likely to be impacted by contamination from the Site owing to the distance that would be required for contaminant transport.

Based upon the above mentioned MCP classifications, the risk assessment and remediation plans for groundwater at the NWIRP site should include, but not be limited to, the following exposure pathways:

#### Human Health:

- a) use as a public water supply, including consumption and other domestic uses,
- b) use for industrial processes,
- c) worker exposure during excavation,
- d) recreational exposures resulting from discharge to surface water.

#### Ecological:

- a) effects on the biota that make up the benthic community, and the food chain above considering persistence and bioaccumulation.

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For your information, the Department has promulgated default cleanup standards for many contaminants in both soil and groundwater, considering various current and future use scenarios and exposures, which may be used in lieu of a risk assessment (MCP Method 1 risk evaluation). Provided the NWIRP site meets the criteria outlined in the MCP for use of Method 1, EPA and the Navy may choose to use these standards or to develop site specific cleanup criteria.

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**TABLE 1**

**Naval Weapons Industrial Reserve Plant (NWIRP), Bedford, Massachusetts, Groundwater Use and Value Determination**  
**Massachusetts Department of Environmental Protection**  
**September, 1998**

USE AND VALUE FACTORS	NWIRP SITE #1, 261 SITE SPECIFIC DETERMINATION
Quantity	<ul style="list-style-type: none"> <li>• Low yield on site and medium to high yield throughout study area.</li> </ul>
Quality	<ul style="list-style-type: none"> <li>• Elevated levels of chlorinated compounds on site migrating into study area groundwater. Site groundwater contaminants include volatile organic compounds (primarily tetrachloroethylene, trichloroethylene and BTEX compounds).</li> </ul>
Current Public Drinking Water Supply	<ul style="list-style-type: none"> <li>• DEP-approved Zone II<sup>1</sup> in the study area, on site Municipal Aquifer Protection District encompasses DEP-Approved Zone II area as well as Zones IIIA and B<sup>2</sup> within the study area.</li> <li>• Town water produced in Shawsheen Road Wells (outside the study area) supplemented by MWRA drinking water through a connection to the Lexington system; Hartwell Road Wells (within the study area) and Turnpike Road Wells (outside the study area) inactive due to contamination.</li> <li>• Not a Sole Source Aquifer, municipal water connections to the towns of Burlington, Billerica and Concord are available for emergency use only.</li> </ul>

<sup>1</sup> **Zone II** means the area of an aquifer which contributes water to a well under the most severe pumping and recharge conditions that can be realistically anticipated (180 days of pumping at approved yield, with no recharge from precipitation). It is bounded by the groundwater divides which

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Current Private Drinking Water Supply	<ul style="list-style-type: none"> <li>Private water supplies are located in the Study Area for potable and agricultural uses.</li> </ul>
Likelihood and Identification of Future Drinking Water Use	<ul style="list-style-type: none"> <li>Study Area groundwater is designated by the Commonwealth as Groundwater I Category (GW1) commensurate with the designation of approved Zone II and the Municipal Aquifer Protection District<sup>1</sup>.</li> <li>Study Area is highly urbanized, including mixed use, industrial and commercial development, and residential housing.</li> <li>Aquifer is designated by the Town as an area for future drinking water supplies upon the implementation of a wellhead treatment system to decontaminate the water supply. Standby status as a potential drinking water source is mandated by municipal agreement with MWRA.</li> <li>There are no known Deeds of Environmental Restriction or Activity and Use Limitations on the Study Area properties.</li> </ul>
Other Current or Reasonable Expected Ground Water Use(s) in Review Area	<ul style="list-style-type: none"> <li>Several groundwater wells in the study area are used for non-potable activities such as irrigation.</li> </ul>

result from pumping the well and by the contact of the aquifer with less permeable materials such as till or bedrock. In some cases, streams or lakes may act as recharge boundaries. In all cases, Zone II shall extend up gradient to its point of intersection with prevailing hydrogeologic boundaries (a groundwater flow divide, a contact with till or bedrock, or a recharge boundary).

<sup>2</sup> **Zone III** means that land area beyond the area of Zone II from which surface water and groundwater drain into Zone II. The surface drainage area as determined by topography is commonly coincident with the groundwater drainage area and will be used to delineate Zone III. In some locations, where surface and groundwater drainage are not coincident, Zone III shall consist of both the surface drainage and the groundwater drainage areas.

<sup>3</sup> **Aquifer Protection District** means an area designated by a municipality specifically for the protection of groundwater quality (to ensure its availability for use as a source of potable water supply) is considered a Potential Drinking Water Source Area under the MCP. These municipal designations must be in the form of: a) a local ordinance or bylaw adopted by the municipality (e.g., an Aquifer Protection District or Zone); b) an intermunicipal agreement approved by the municipal legislative body; or c) an executed inter-governmental contract for the purchase or sale of drinking water. Groundwater contamination within these designated areas must be cleaned up to GW-1 standards to meet the requirement of a Permanent Solution.

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	<ul style="list-style-type: none"><li>• In the future, population increases and commercial development will require increased municipal drinking water well use, and possibly, use of private well water for irrigation.</li></ul>
Ecological Value	<ul style="list-style-type: none"><li>• Groundwater discharge to Elm Brook, Shawsheen River and several naturally occurring beaver ponds.</li></ul>
Public Opinion	<ul style="list-style-type: none"><li>• Public comment occurred during the promulgation of MCP regulations, and under CERCLA will occur during the Record of Decision process. Periodic meetings of the NWIRP Restoration Advisory Board also allow opportunities for public comment. A municipal bylaw, approved by the Massachusetts Attorney General and passed at Public Meeting, was promulgated to establish the current Aquifer Protection District, effectively altering the groundwater classification to GW1 in the study area. Expect substantial public opposition to the reactivation of inactive municipal wells until such time as a wellhead treatment system is installed, or if a challenge were received disputing the Aquifer Protection District Designation.</li></ul>

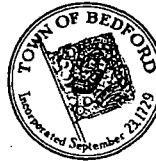


# Record of Decision Naval Weapons Industrial Reserve Plant Bedford Appendices

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## Appendix H: Town of Bedford Statement of Support for Land Use Controls

TOWN OF BEDFORD  
BEDFORD, MASSACHUSETTS 01730



TTD/TTY: 781-687-6124

Richard T. Reed, *Town Manager*

Town Hall  
Bedford, MA 01730  
781-275-1111

August 25, 2009

NAVFAC MID-ATLANTIC, Northeast IPT  
Attn: OPNEEV (Maritza Montegross)  
9742 Maryland Avenue  
Norfolk, VA 23511-3095

Dear Ms. Montegross:

The purpose of this letter is to address concerns of the United States Navy (Navy), the United States Environmental Protection Agency (EPA), and the Massachusetts Department of Environmental Protection (MassDEP) regarding implementing groundwater use restrictions in areas of contamination adjacent to the Naval Weapons Industrial Reserve Plant (NWIRP) property located by Hartwell Road in Bedford, Massachusetts. As described below, the Town agrees to support the Navy with implementing and enforcing institutional controls until the Navy has completed restoration of the groundwater aquifer which satisfies the Town's Aquifer Protection District Bylaw, found at Section 13 of the Bedford Zoning Bylaws.

The Navy has kept the Town apprised of the progress on environmental cleanups at NWIRP through periodic Restoration Advisory Board (RAB) meetings and an Information Repository maintained at the Town of Bedford Free Public Library. It is our understanding that Town representatives will have the opportunity to review and comment on the Navy's Proposed Plans for Site 3 (chlorinated solvent plume) and Site 4 (BTEX plume) prior to the Superfund Records of Decision. The Navy has indicated that the Proposed Plans will continue the commitment that the Navy has made to clean up the groundwater contamination which originated from the Site 3 and Site 4 source areas located on NWIRP property and which has impacted adjacent private properties. The Navy has indicated that as part of the site clean up efforts, land use controls (as groundwater use restrictions) will be necessary until groundwater restoration has been achieved.

The Navy has indicated that it will implement controls on the federally-owned property of NWIRP and has requested that the Town support the controls in adjacent areas through existing Town bylaws. The affected adjacent properties are privately owned. To the best of our knowledge, the Board of Health has never issued a private drinking water well permit within the adjacent areas affected by the Site 3 and Site 4 groundwater contaminant plumes. Therefore, while remedial actions are being undertaken at NWIRP and groundwater contamination is present in the aquifer, the Town agrees to the Navy's request to help prevent unacceptable exposure to groundwater contamination in those areas by preventing the installation of private drinking water wells within the affected areas. Section 8 of the Town of Bedford Board of Health, Code of Health Regulations (Private Wells), which was adopted under authority of Chapter 111, Section 31 of Massachusetts General Laws, includes a requirement for any landowner to obtain a permit from the Board of Health to install wells anywhere in the Town of Bedford. Section 8 also provides the Board of Health to require the re-testing of any existing wells for specified parameters if the Board

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believes there is a risk to the public health, safety, or welfare. The contaminants of concern that have been identified at NWIRP Sites 3 and 4 (various volatile organic compounds) are included in the regulation's list of parameters to be tested in private drinking water or irrigation wells.

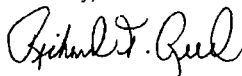
Accordingly, the Town Board of Health will continue to enforce these regulations to ensure that groundwater wells are not installed which would cause a risk to public health, safety, or welfare. Any proposed change in land use or use of groundwater as a drinking water source would have to be reviewed and approved by Board of Health, which is well aware of the potential for groundwater contamination in this area. Accordingly, the Board of Health voted at their July 8, 2009 meeting the following motion:

**Voted** to give assurances to the Town Manager that the Bedford Board of Health will not issue drinking water well permits within the adjacent areas affected by Site 3 and Site 4 (Naval Weapons Industrial Reserve Plant Superfund site) groundwater contaminant plumes as long as the contaminants cause water quality to be below acceptable drinking water standards.

Please continue to use our Director of Public Health, Mr. David Black, as our point of contact for matters concerning groundwater contamination associated with NWIRP. Please also include our Conservation Administrator, Ms. Elizabeth Bagdonas, in such correspondence given that the affected areas are within, or are adjacent to, delineated wetlands within the Town of Bedford.

Further, by copy of this letter, I am requesting that both the Board of Health and the Conservation Commission ensure that the Navy is immediately notified in the event any changes are proposed in the land and/or groundwater use in the properties abutting NWIRP.

Sincerely,



Richard T. Reed  
Town Manager

Copy to:     Richard Warrington, Director, Bedford Public Works  
               David Black, Director, Bedford Board of Health  
               Elizabeth Bagdonas, Bedford Conservation Administrator  
               Matt Audet, EPA  
               Mike Moran, Ma5sDEP  
               Jim Ropp, Tetra Tech ✓